FIG. 1A

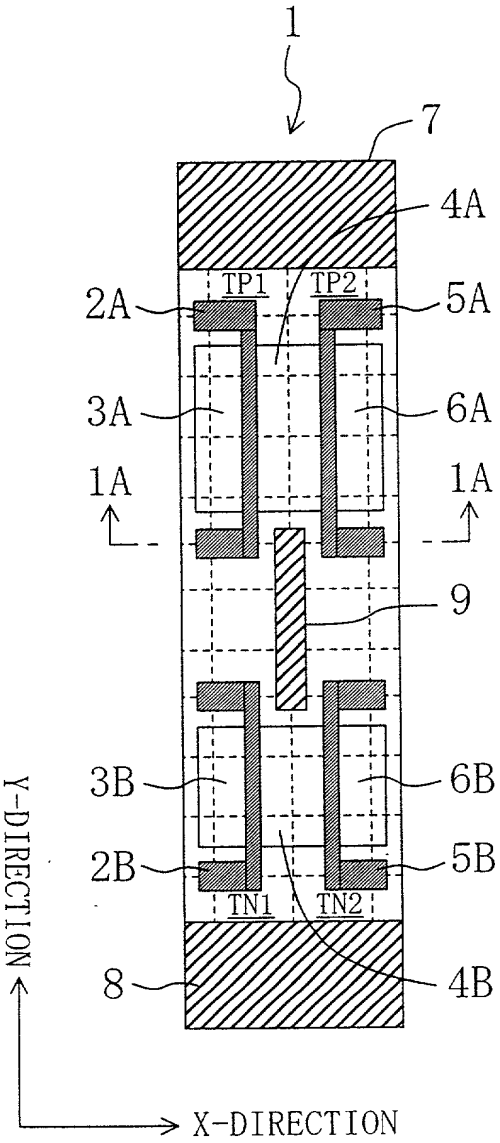

1
7
4A
TP1
TP2
2A
5A
3A
6A
1A
1A
9
3B
6B
2B
5B
TN1
TN2
8
4B
Y-DIRECTION
X-DIRECTION

FIG. 1B

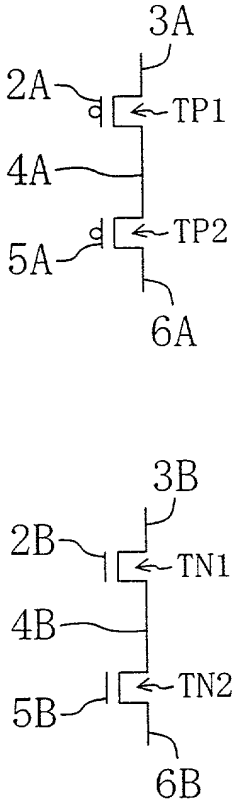

3A
2A
TP1
4A
TP2
5A
6A
3B
2B
TN1
4B
TN2
5B
6B

FIG. 1C

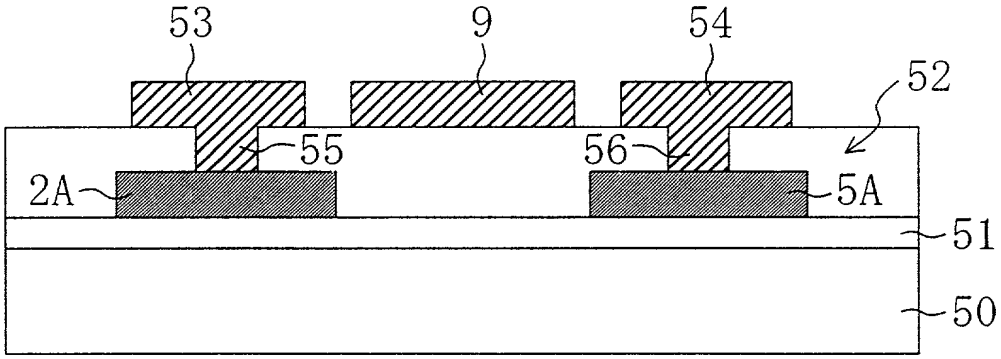


FIG. 1D

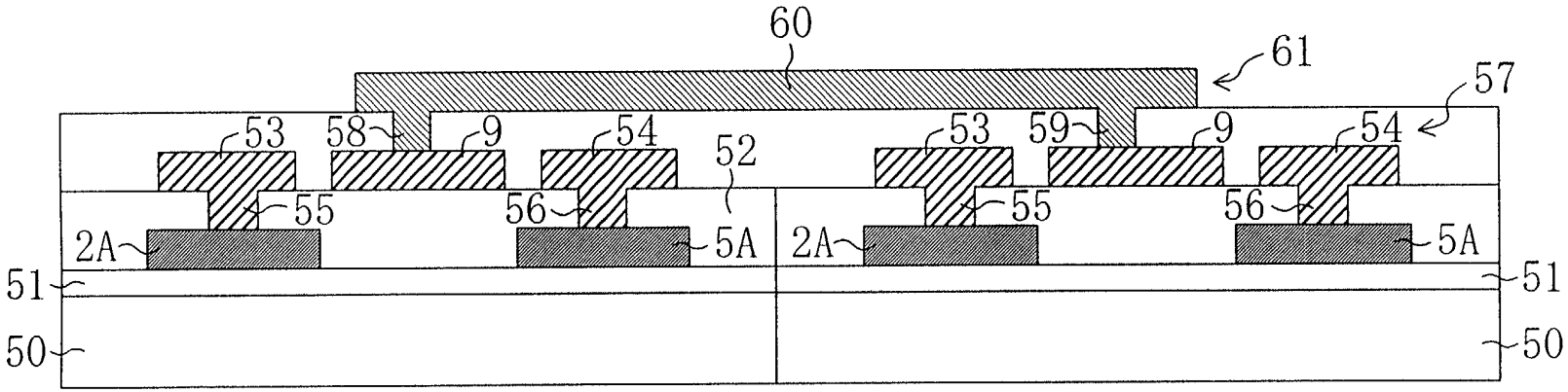


FIG. 1E

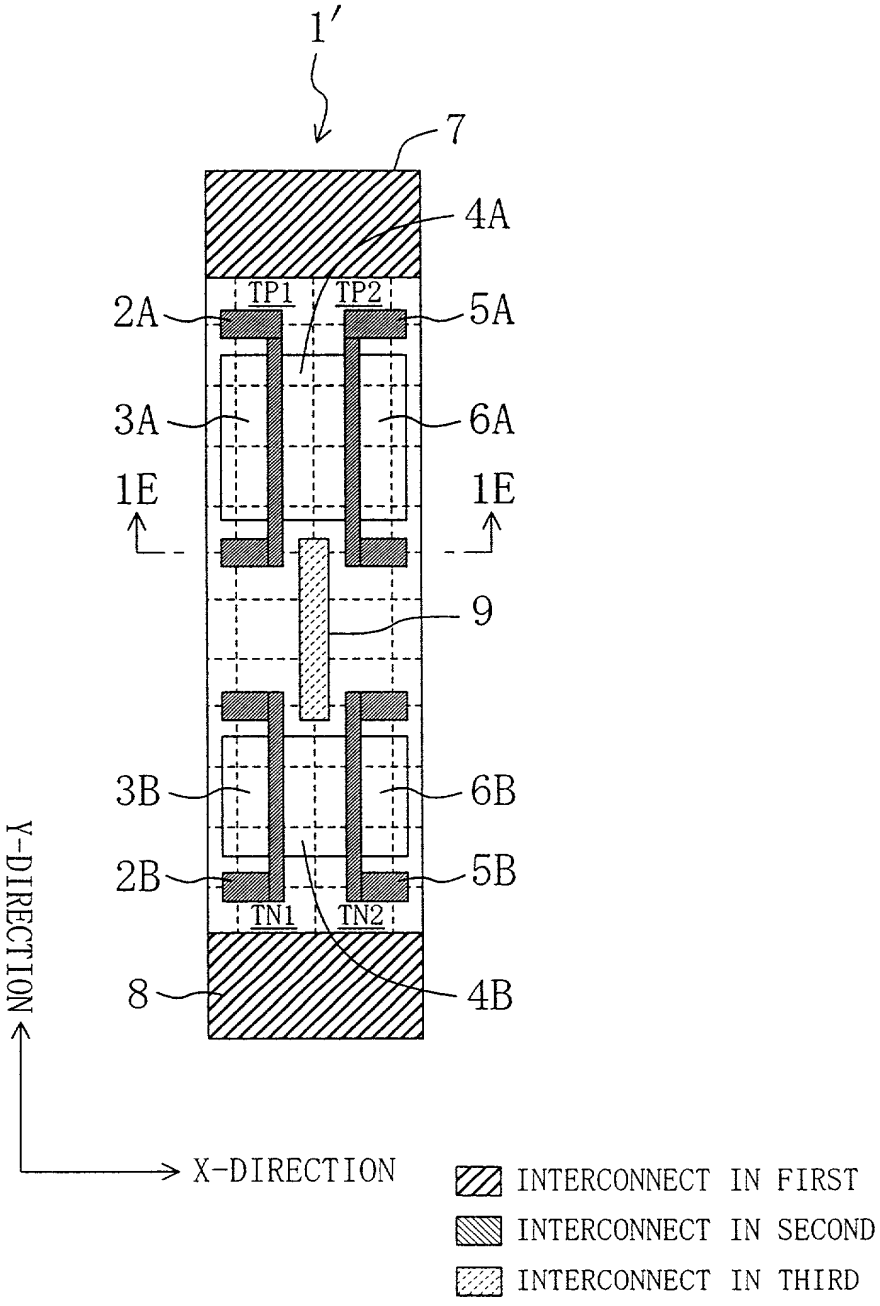

1′
7
4A
TP1
TP2
2A
5A
3A
6A
1E
1E
9
3B
6B
2B
5B
TN1
TN2
8
4B
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
INTERCONNECT IN THIRD

FIG. 1F

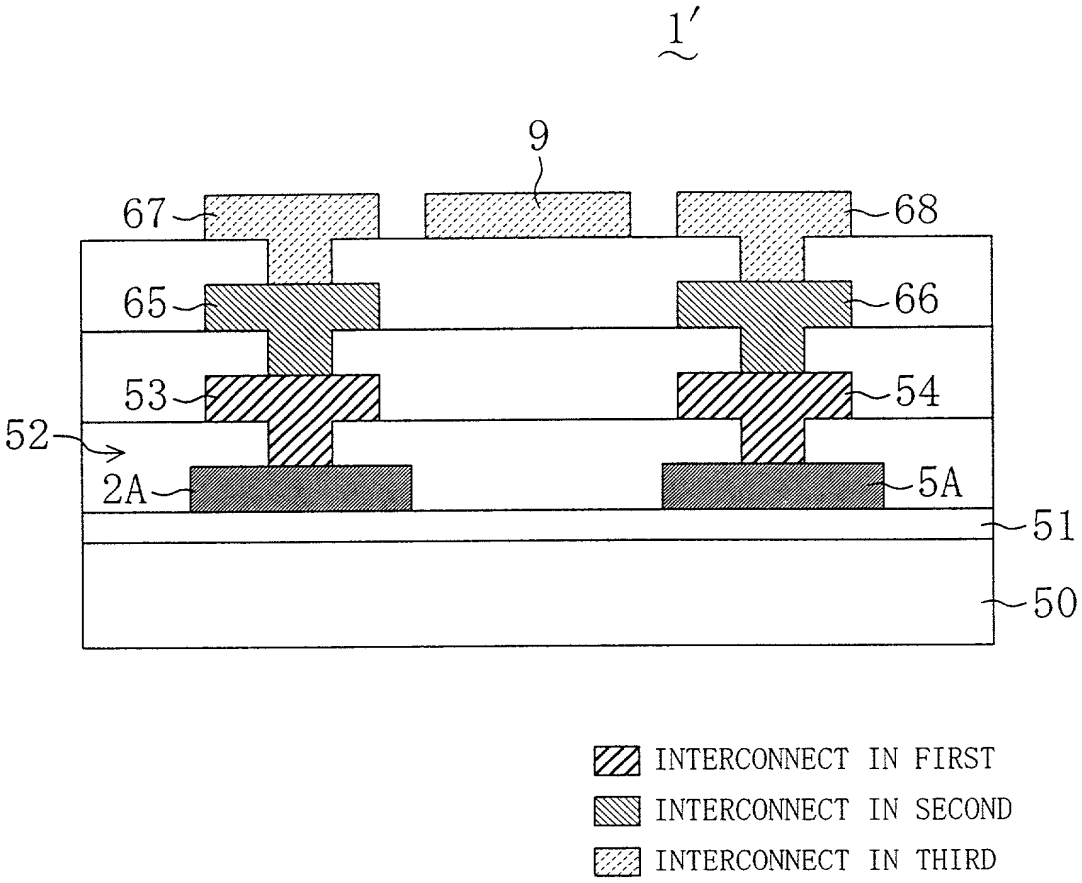

1′
9
67
68
65
66
53
54
52
2A
5A
51
50
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
INTERCONNECT IN THIRD

FIG. 1G

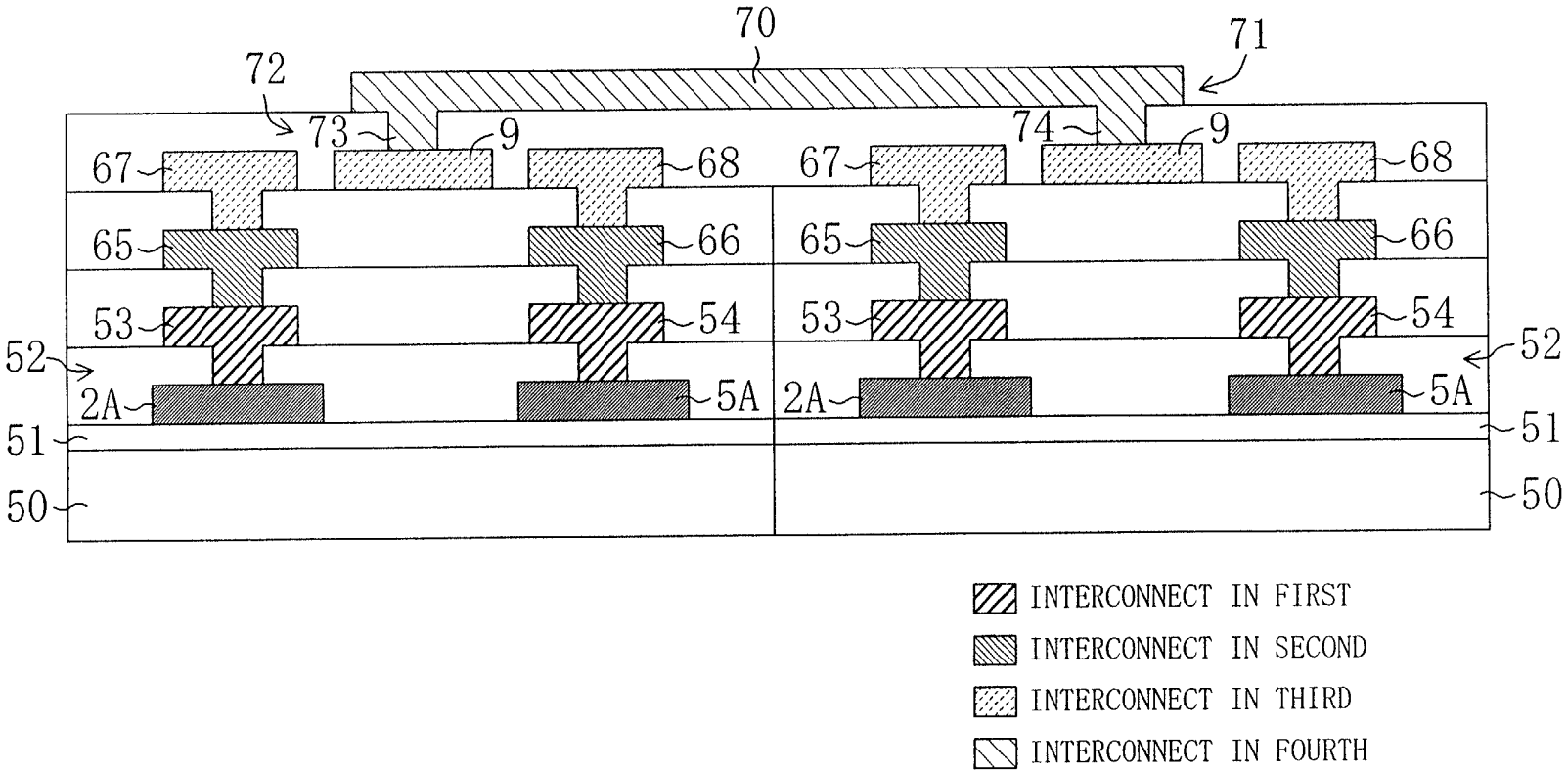

70
71
72
73
74
9
9
67
68
67
68
65
66
65
66
53
54
53
54
52
52
2A
5A
2A
5A
51
51
50
50
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
INTERCONNECT IN THIRD
INTERCONNECT IN FOURTH

FIG. 2A

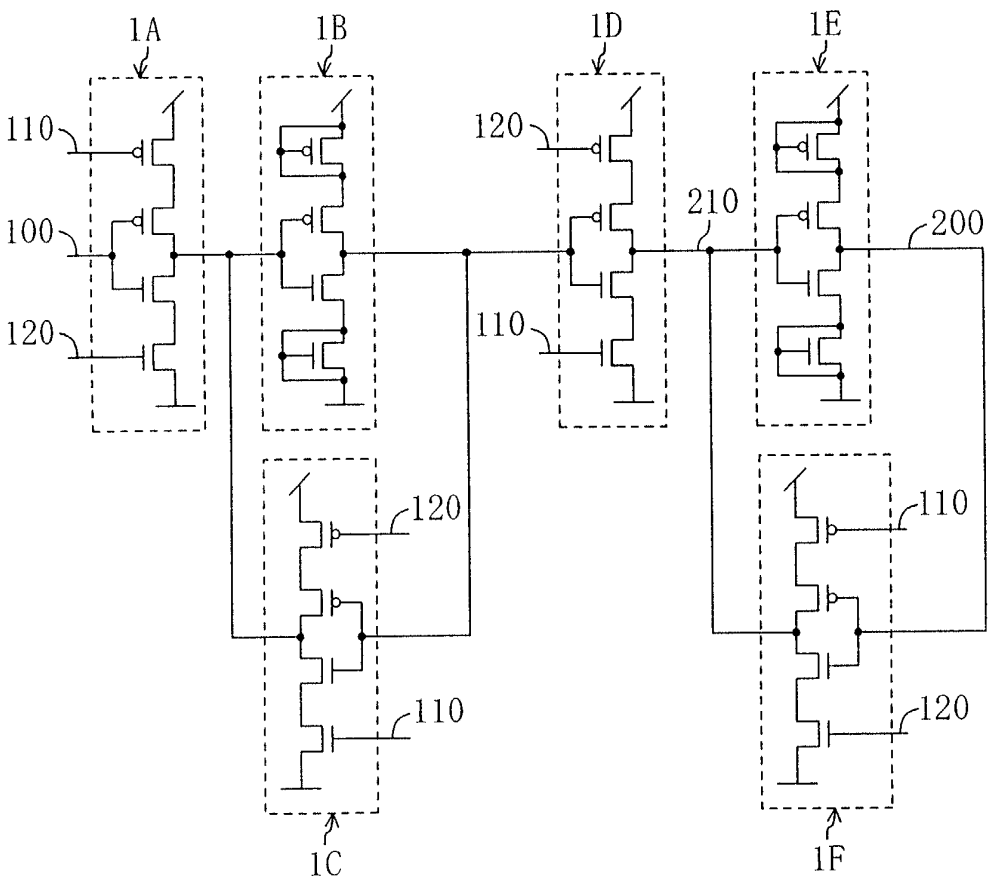


FIG. 2B

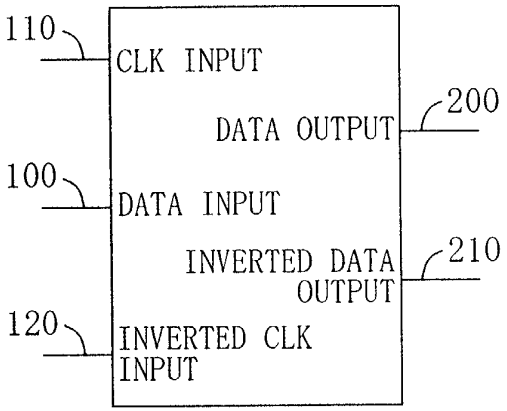


FIG. 2C

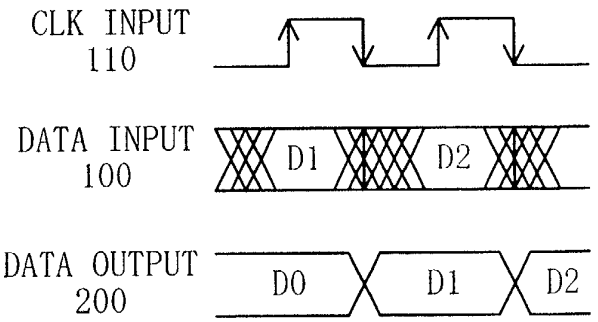


FIG. 3A

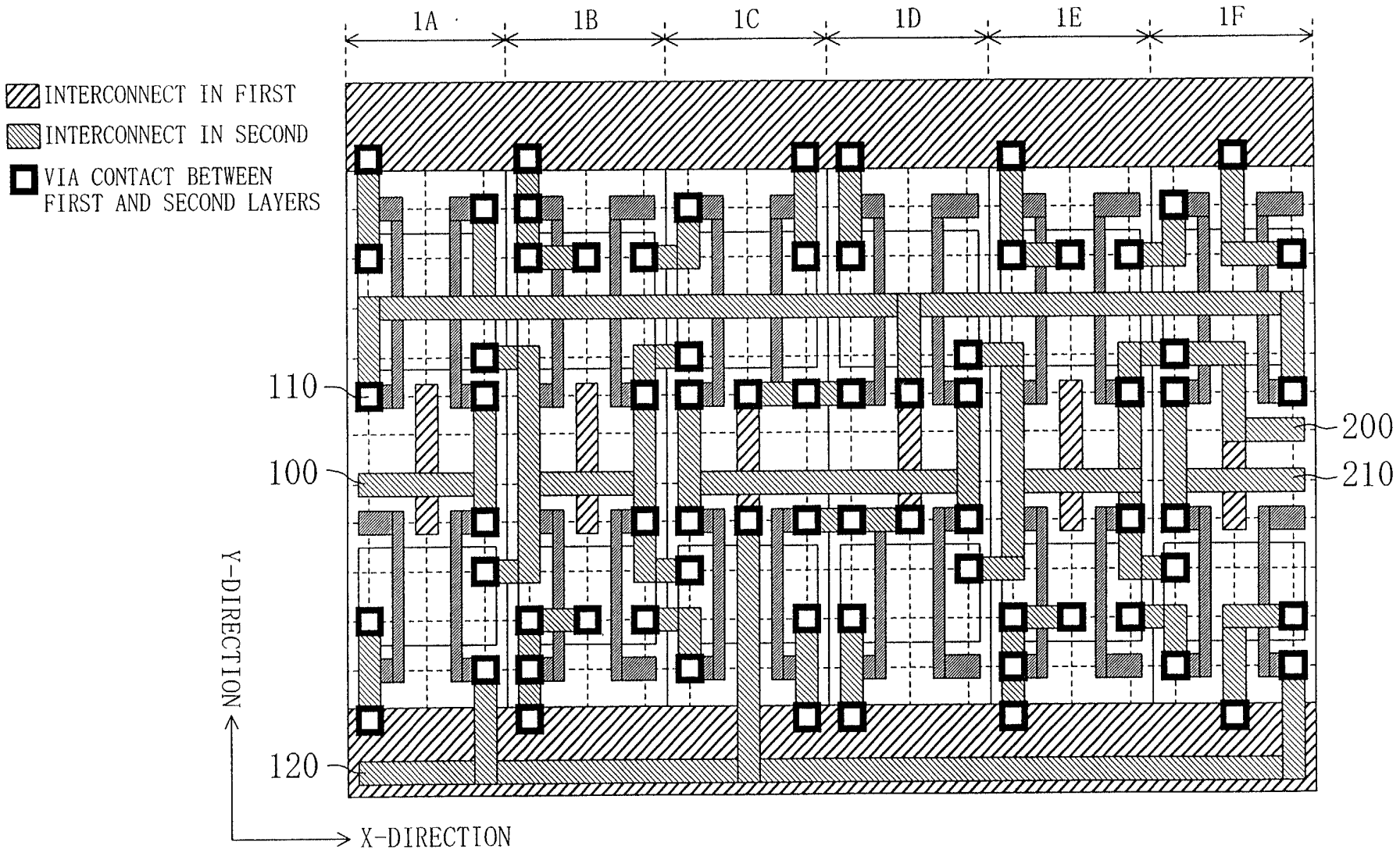

1A
1B
1C
1D
1E
1F
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
110
100
120
200
210
Y-DIRECTION
X-DIRECTION

FIG. 3B

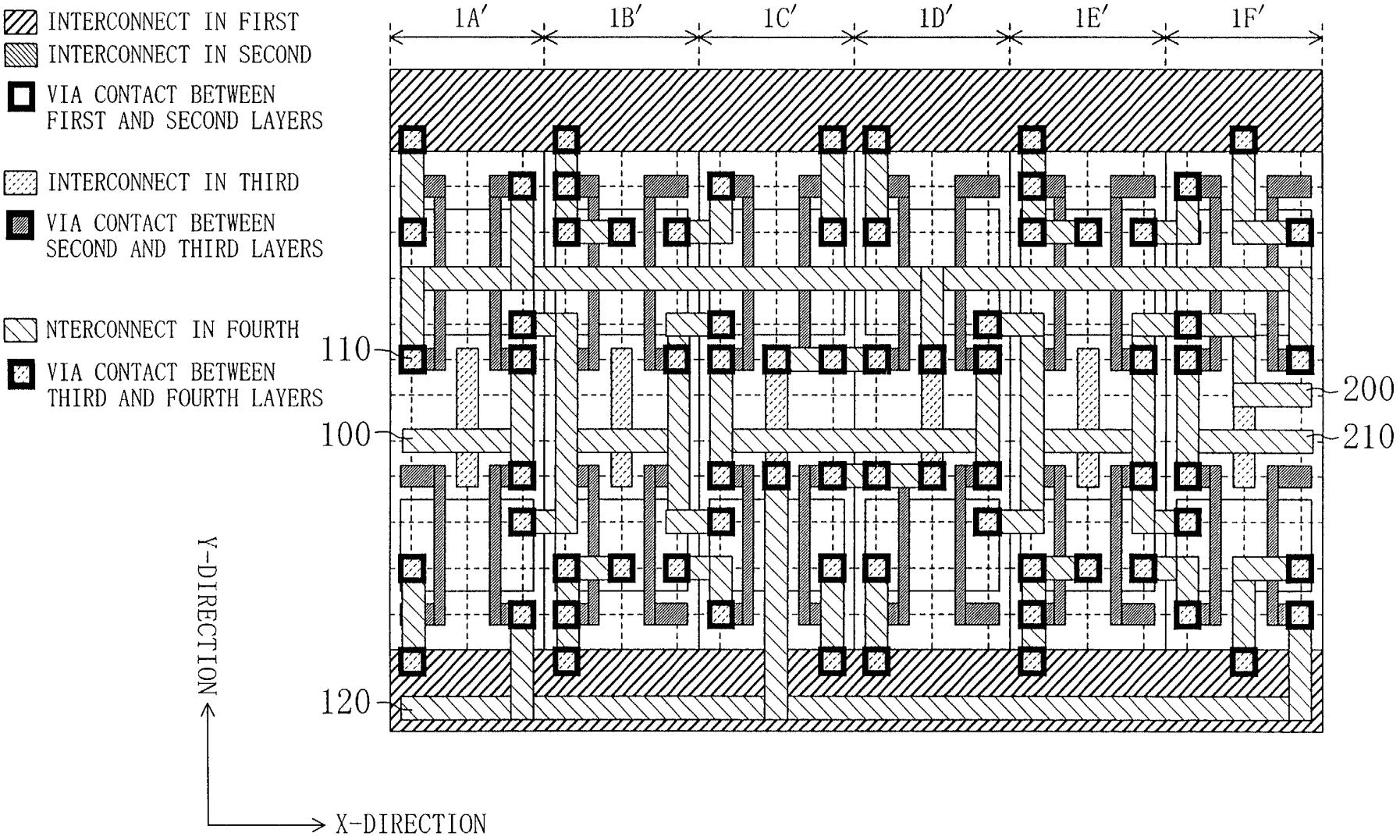

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
INTERCONNECT IN THIRD
VIA CONTACT BETWEEN SECOND AND THIRD LAYERS
NTERCONNECT IN FOURTH
VIA CONTACT BETWEEN THIRD AND FOURTH LAYERS
1A′
1B′
1C′
1D′
1E′
1F′
110
100
120
200
210
Y-DIRECTION
X-DIRECTION

FIG. 4A

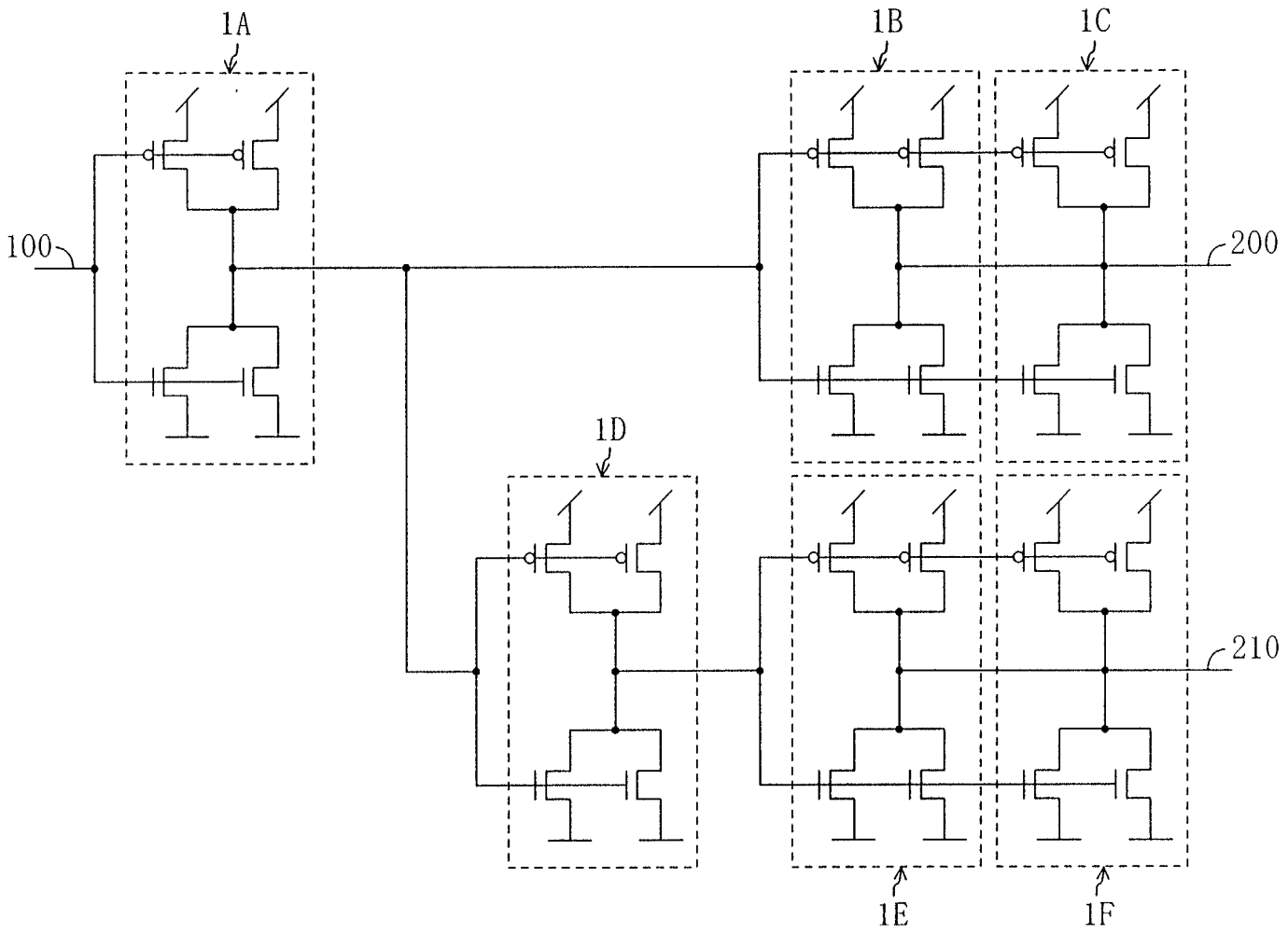

1A
1B
1C
1D
1E
1F
100
200
210

FIG. 4B

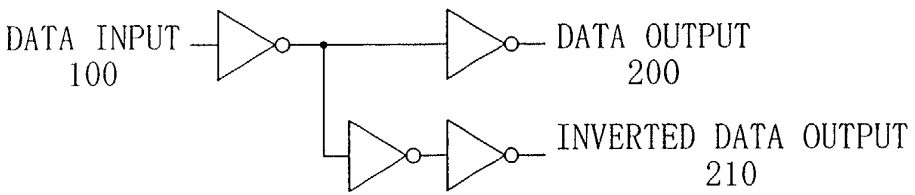

DATA INPUT
100
DATA OUTPUT
200
INVERTED DATA OUTPUT
210

FIG. 5

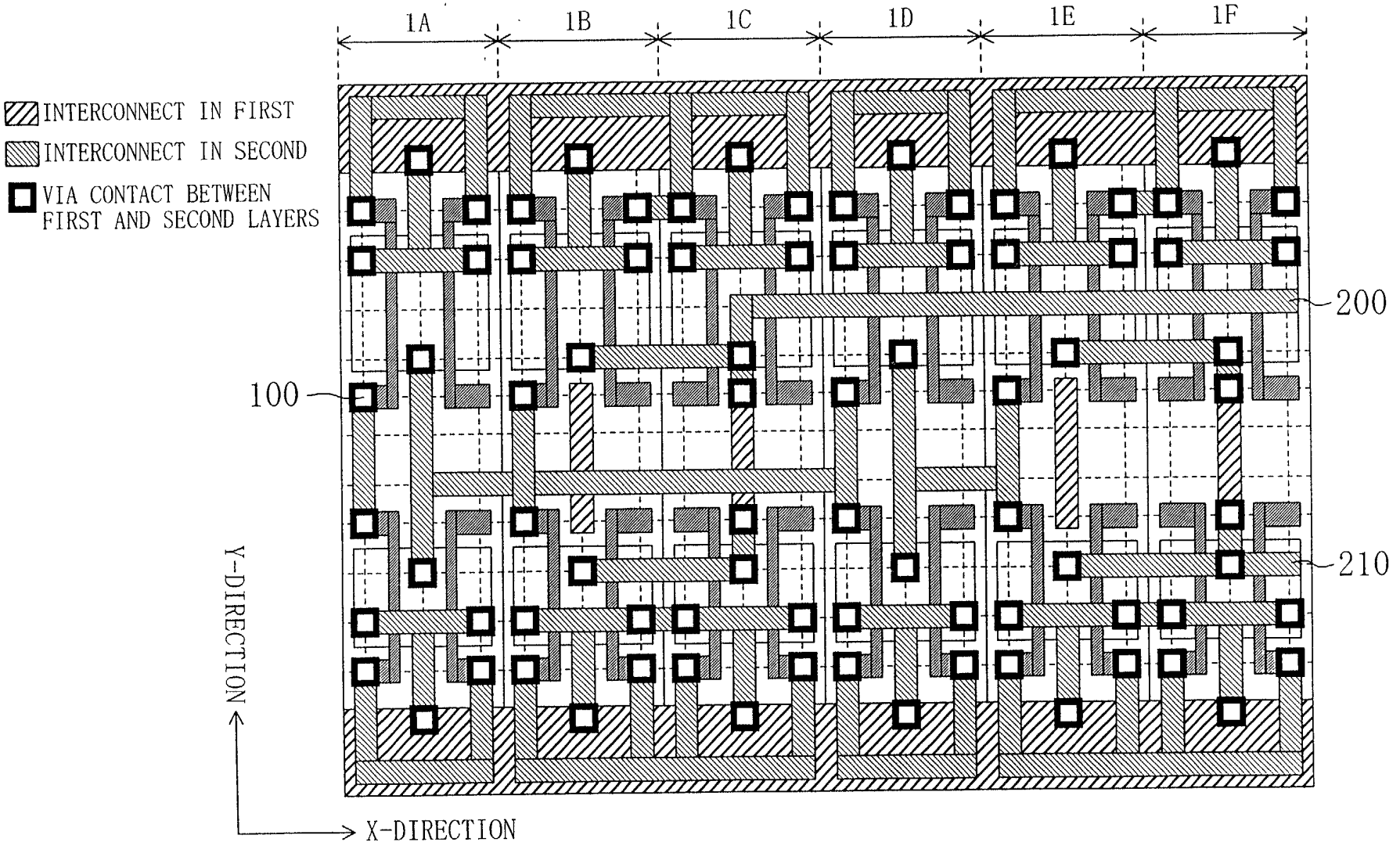

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
1A
1B
1C
1D
1E
1F
100
200
210
Y-DIRECTION
X-DIRECTION

FIG. 6A

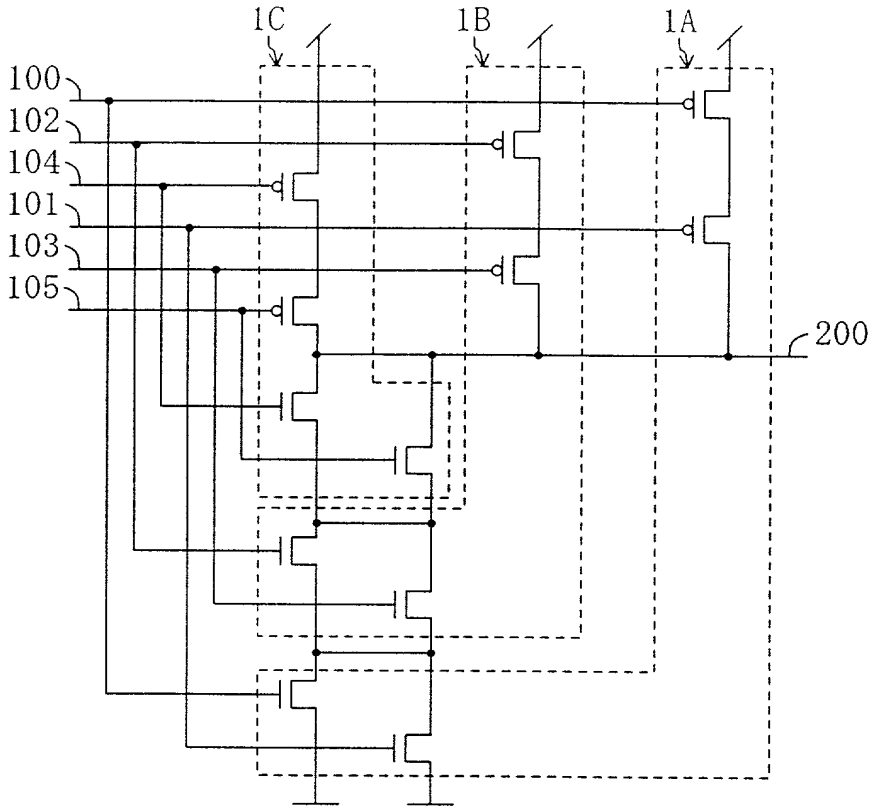

1C
1B
1A
100
102
104
101
103
105
200

FIG. 6B

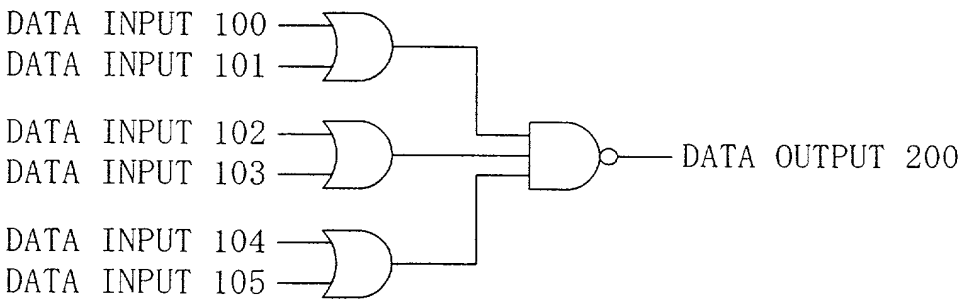

DATA INPUT 100
DATA INPUT 101
DATA INPUT 102
DATA INPUT 103
DATA INPUT 104
DATA INPUT 105
DATA OUTPUT 200

FIG. 7

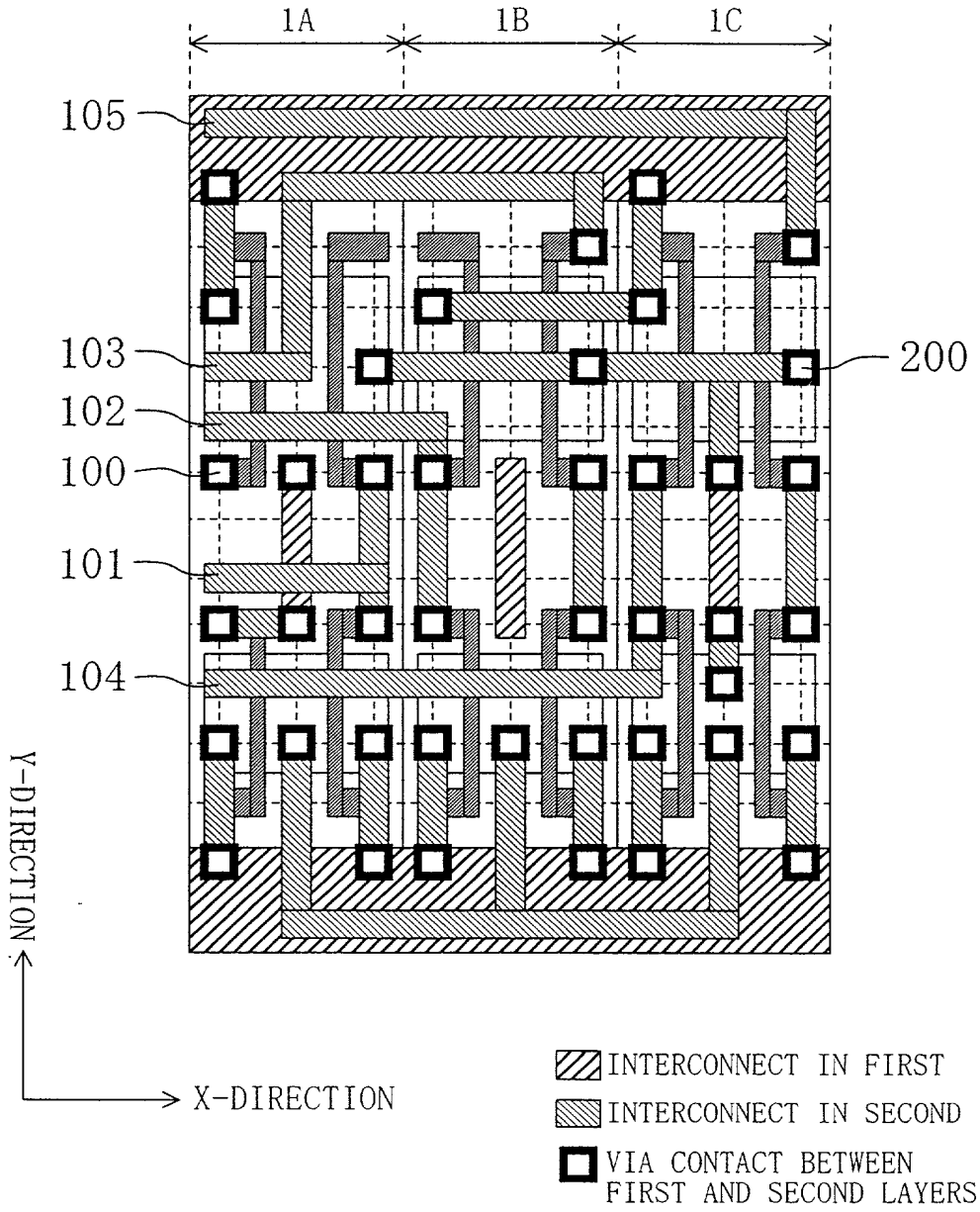

1A
1B
1C
105
103
102
100
101
104
200
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS

FIG. 8A

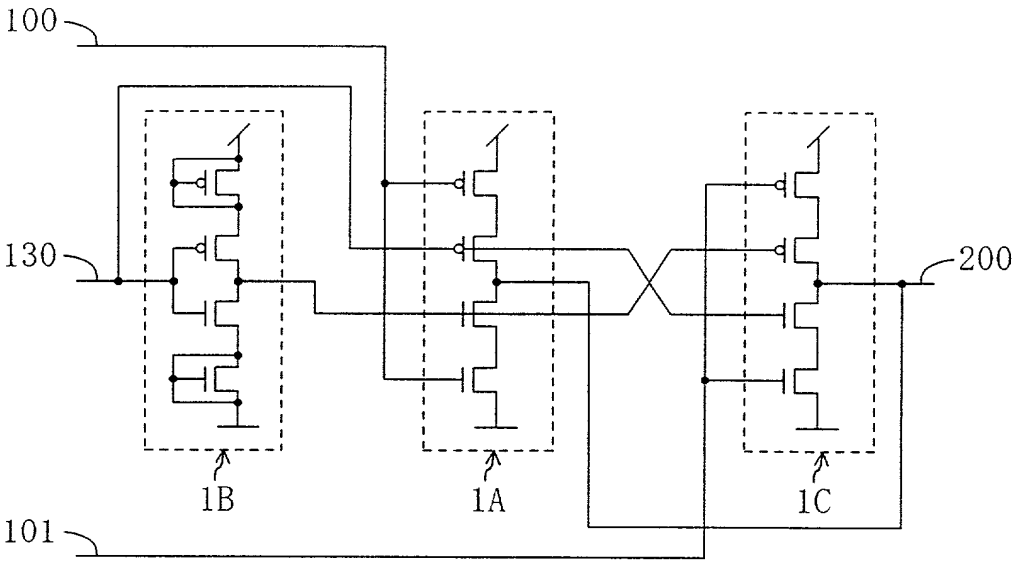
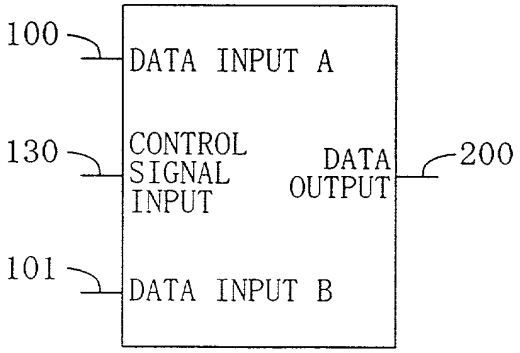


FIG. 8B



WHEN CONTROL SIGNAL IS "H", DATA OUTPUT = DATA INPUT B

WHEN CONTROL SIGNAL IS "L", DATA OUTPUT = DATA INPUT A

FIG. 9

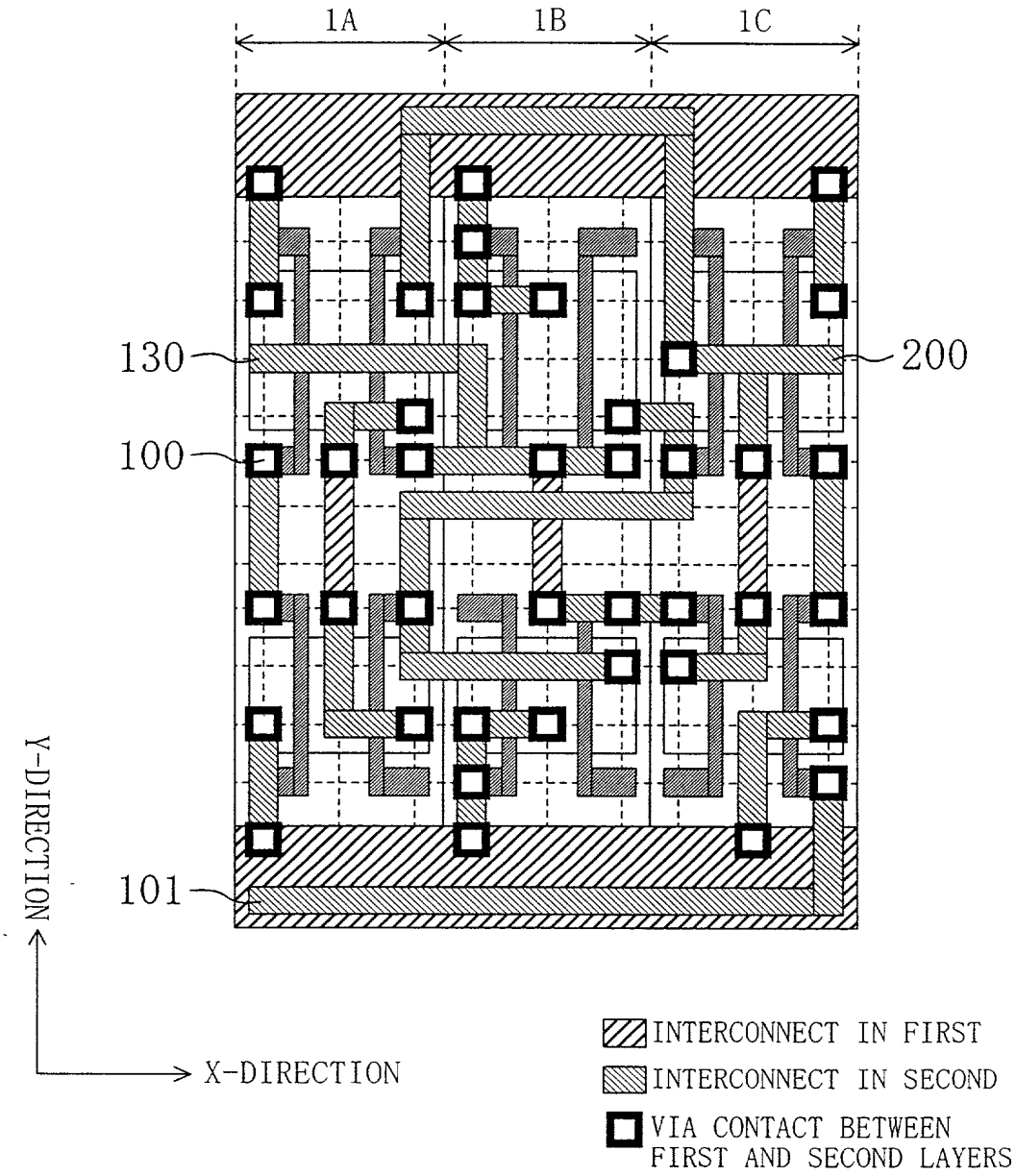

1A
1B
1C
130
200
100
101
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS

FIG. 10

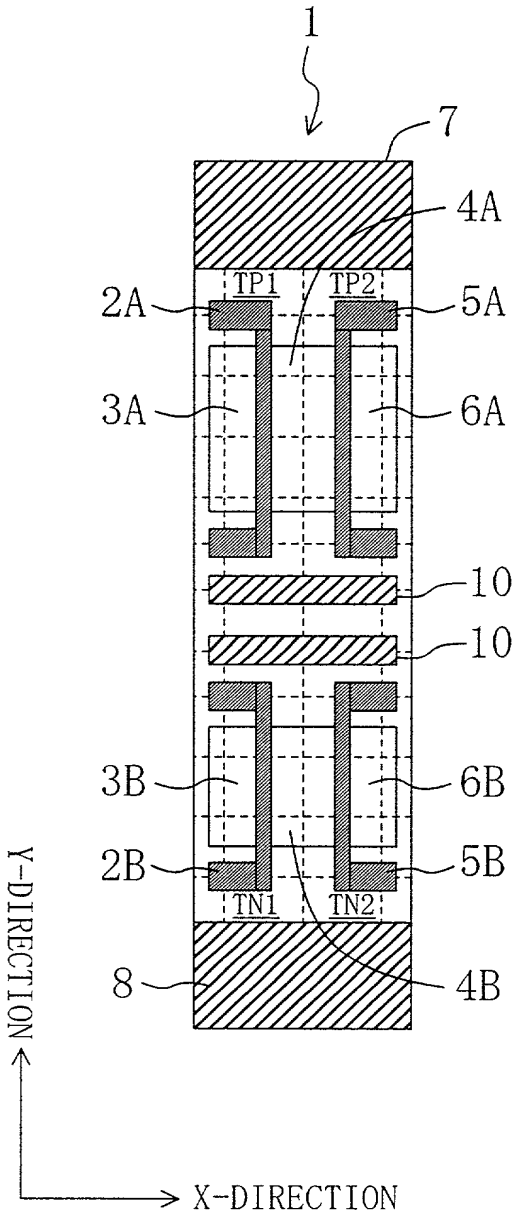

1
7
4A
TP1
TP2
2A
5A
3A
6A
10
10
3B
6B
2B
5B
TN1
TN2
8
4B
Y-DIRECTION
X-DIRECTION

FIG. 11A

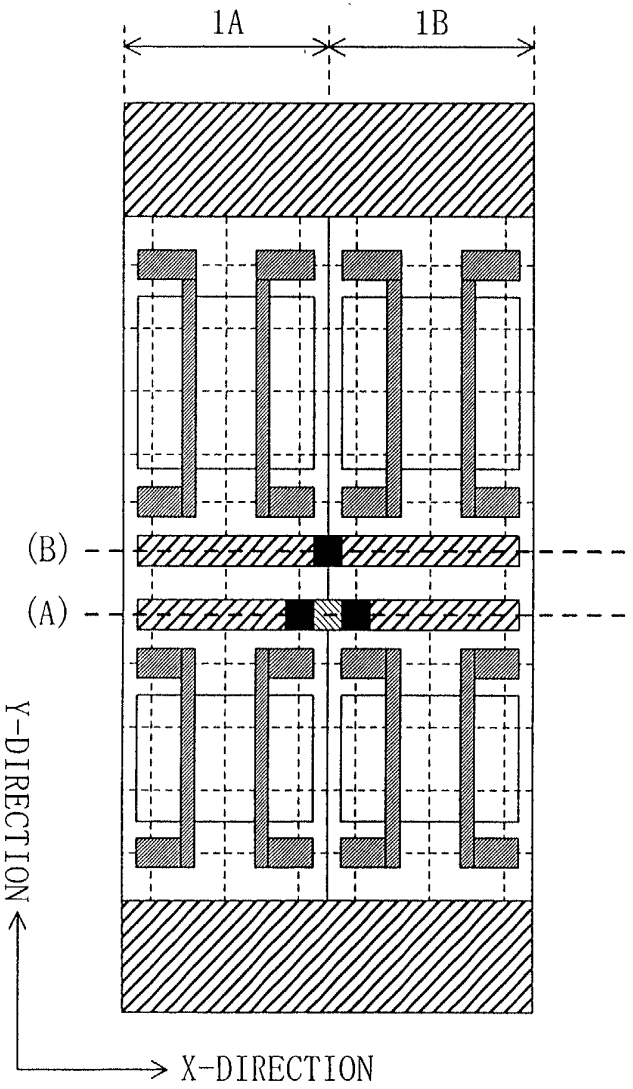


FIG. 11B

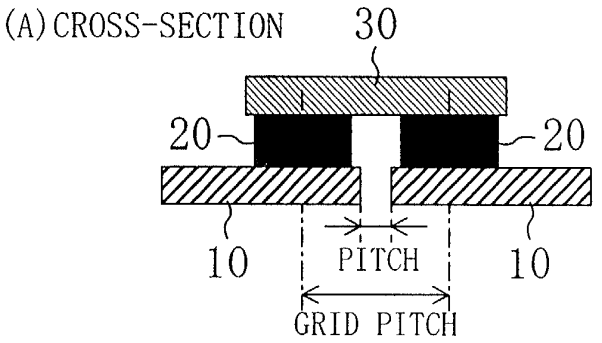


FIG. 11C

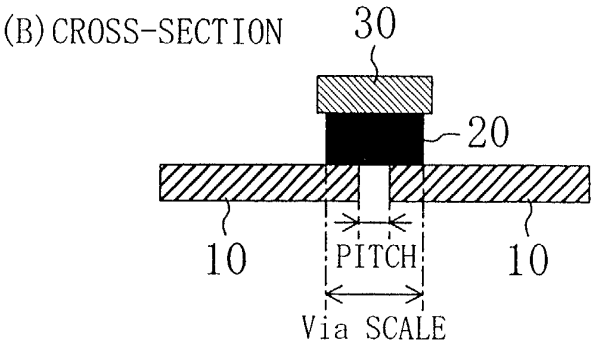


FIG. 12

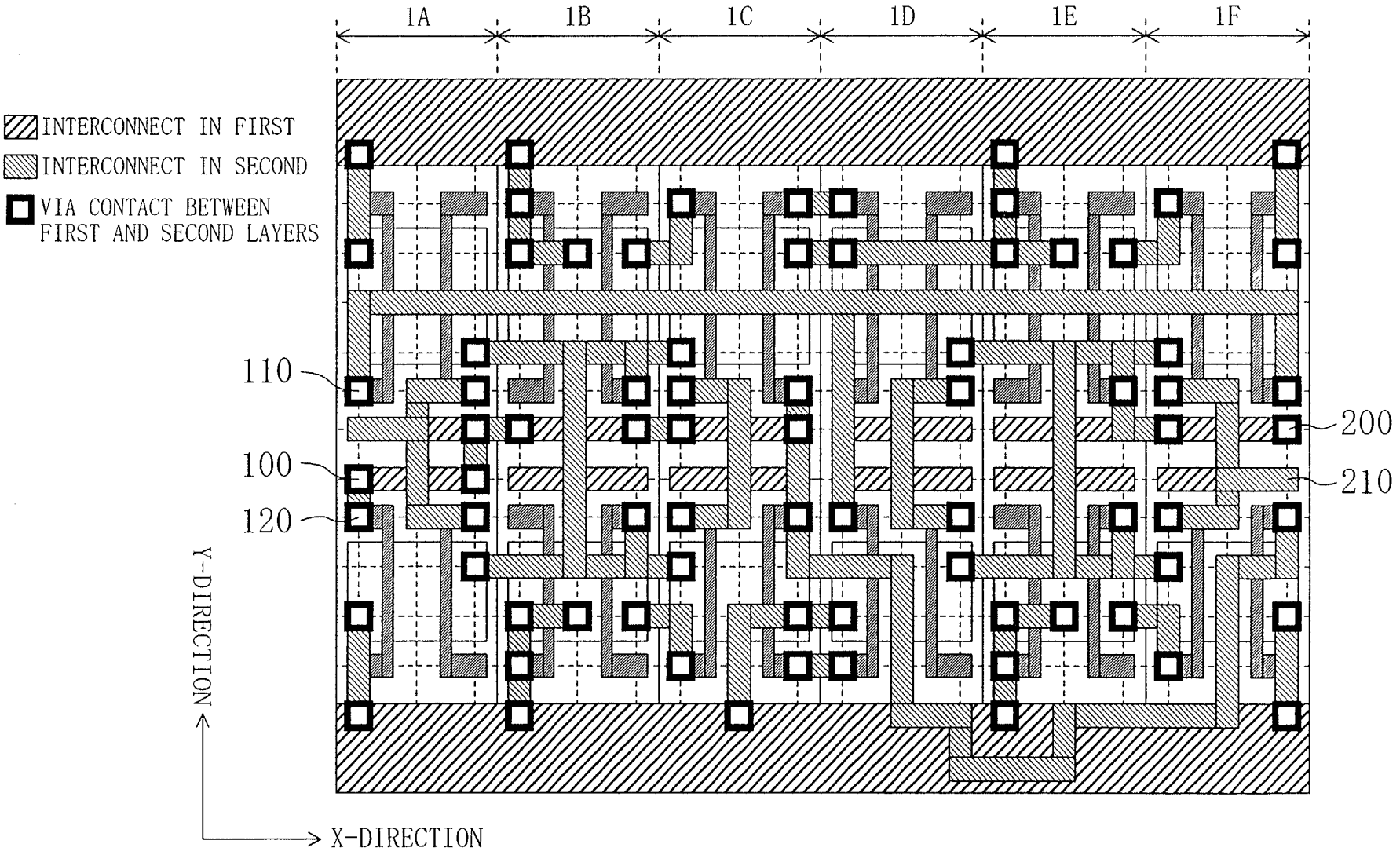

1A
1B
1C
1D
1E
1F
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
110
100
120
200
210
Y-DIRECTION
X-DIRECTION

FIG. 13

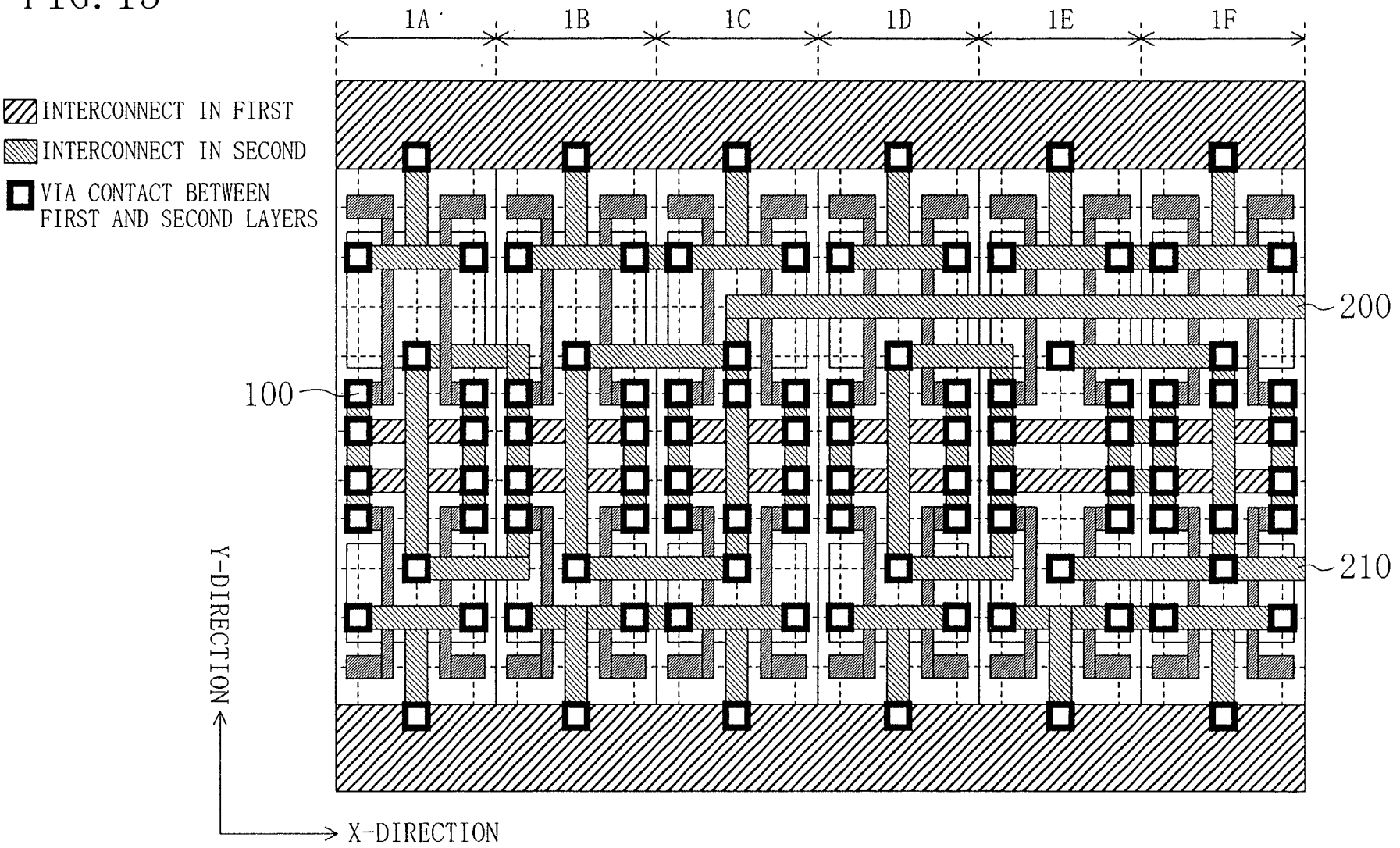

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
1A
1B
1C
1D
1E
1F
100
200
210
Y-DIRECTION
X-DIRECTION

FIG. 14

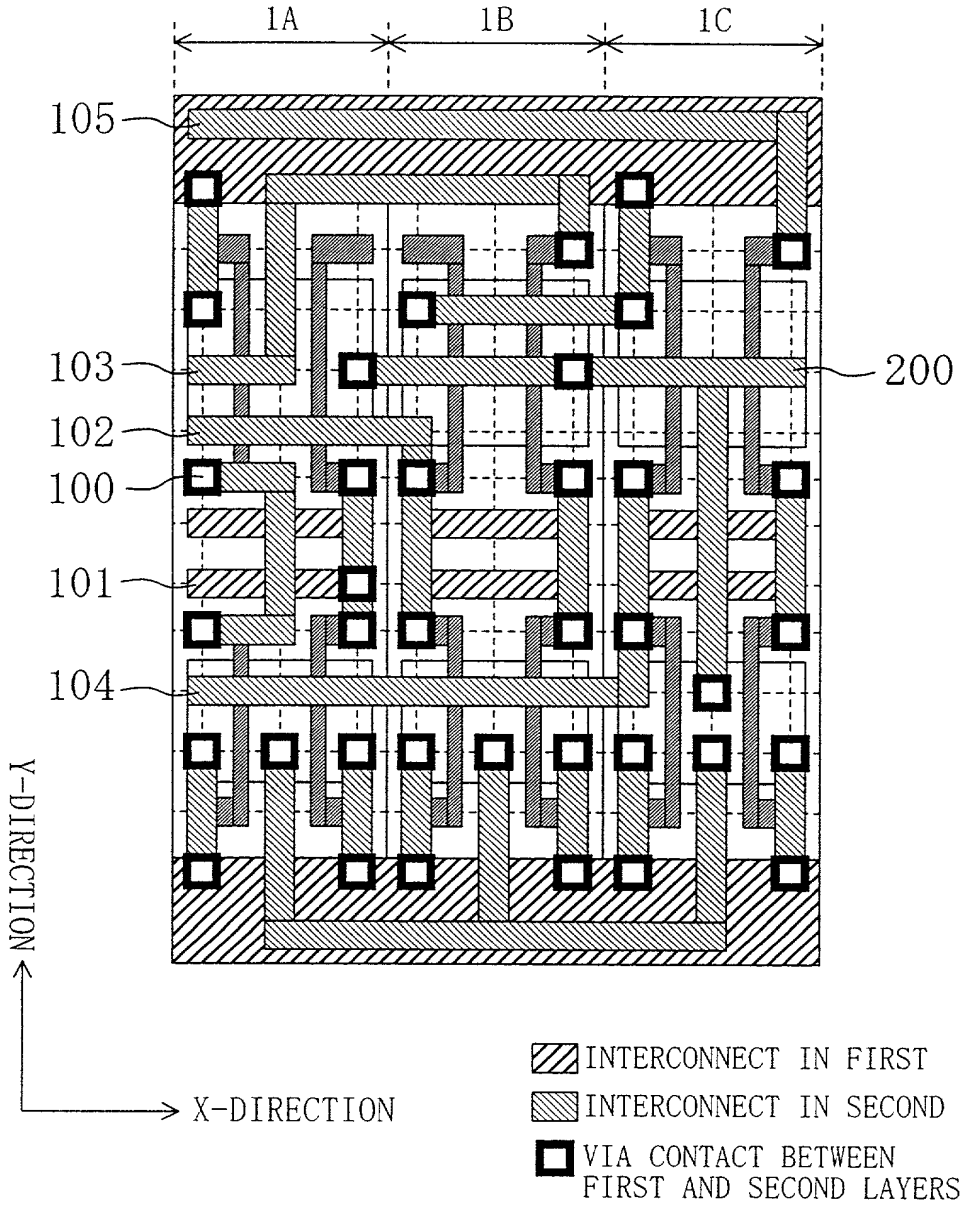

1A
1B
1C
105
103
102
100
101
104
200
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN
FIRST AND SECOND LAYERS

FIG. 15

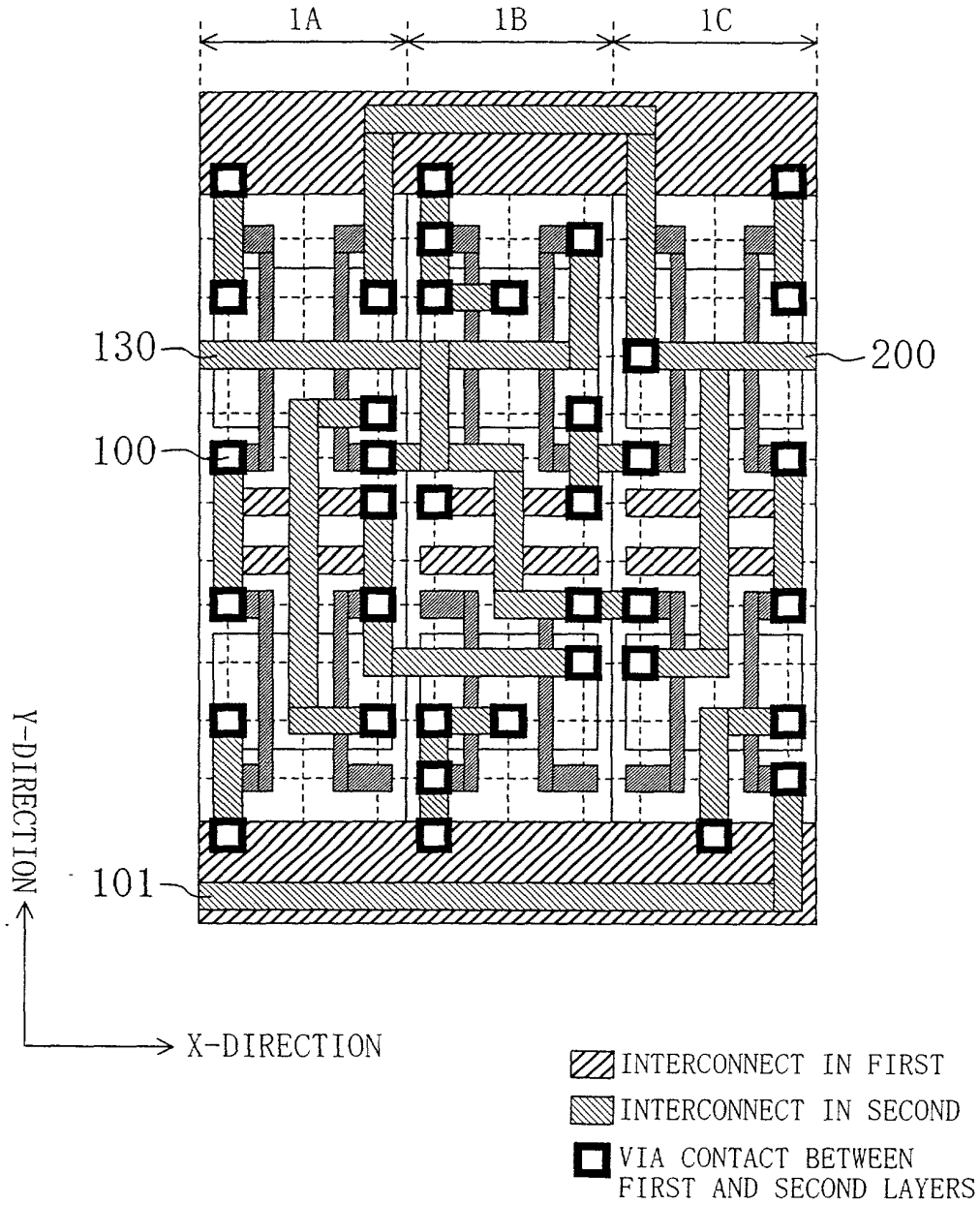

1A
1B
1C
130
200
100
101
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS

FIG. 16

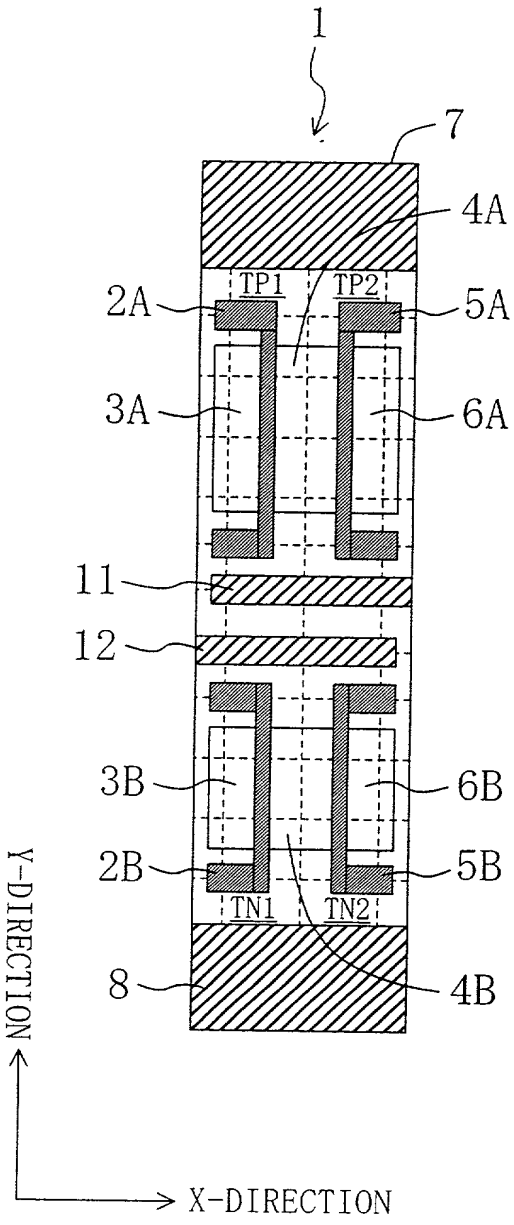

1
7
4A
TP1
TP2
2A
5A
3A
6A
11
12
3B
6B
2B
5B
TN1
TN2
8
4B
Y-DIRECTION
X-DIRECTION

FIG. 17

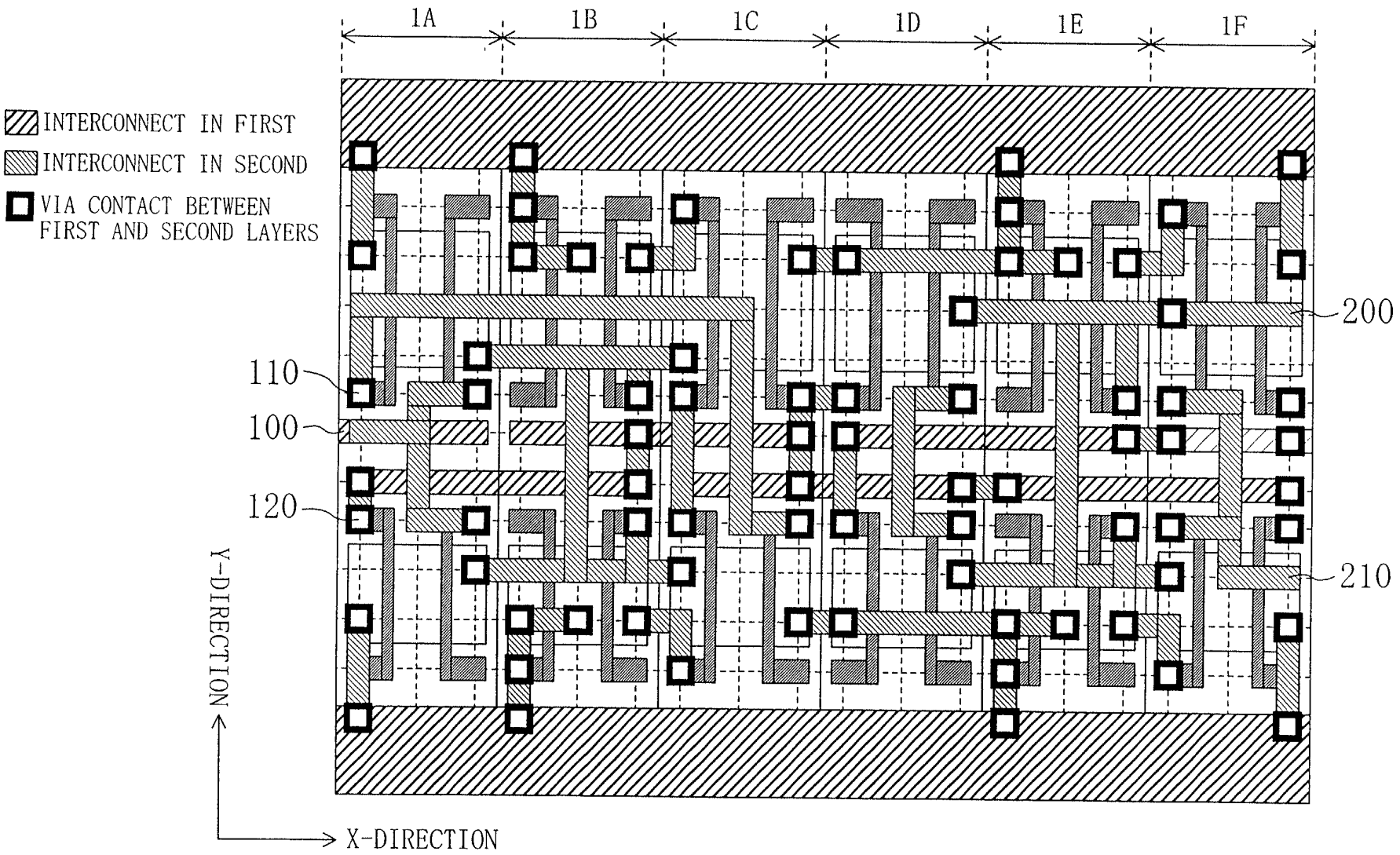

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
1A
1B
1C
1D
1E
1F
200
110
100
120
210
Y-DIRECTION
X-DIRECTION

FIG. 18

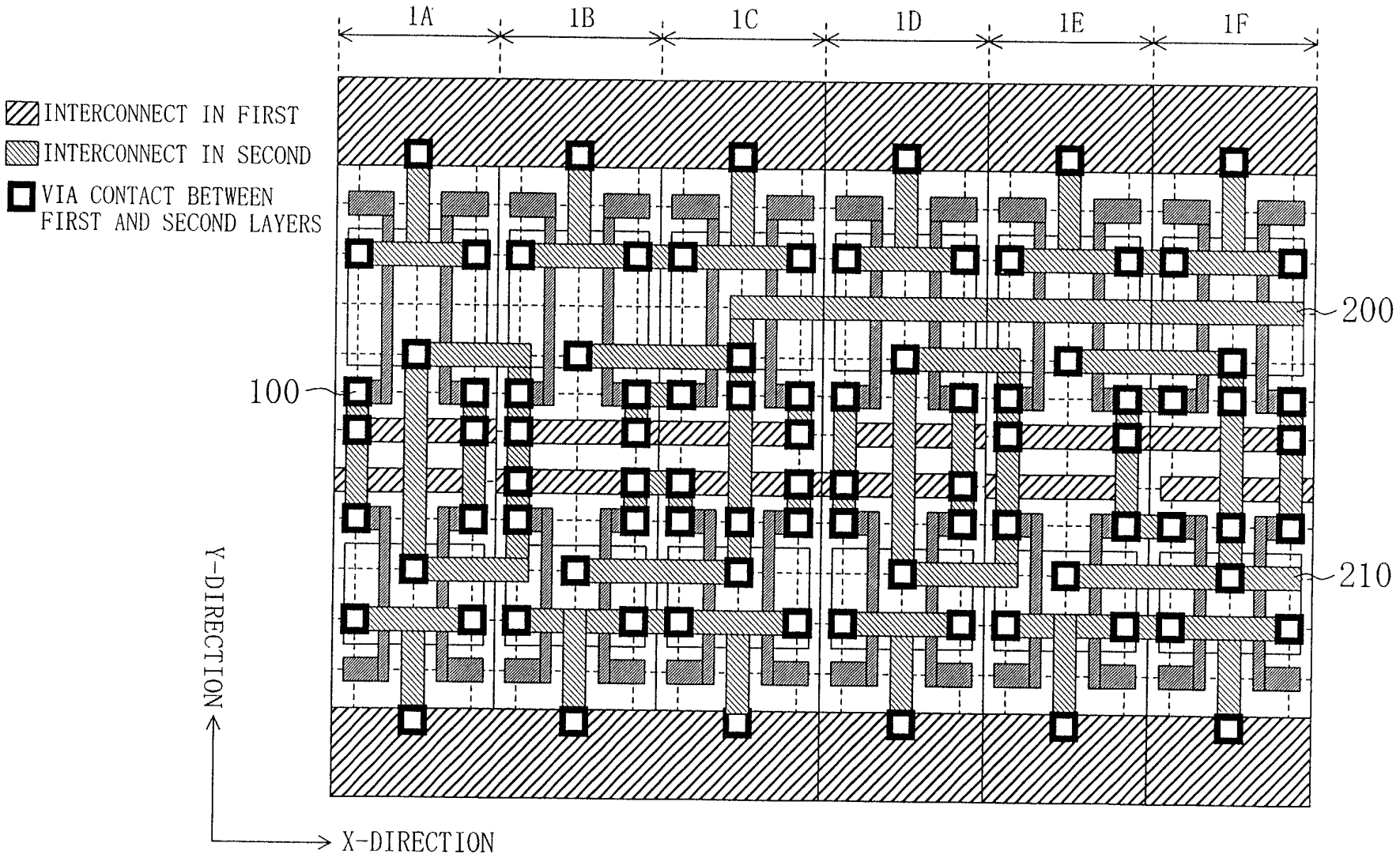

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
1A
1B
1C
1D
1E
1F
100
200
210
Y-DIRECTION
X-DIRECTION

FIG. 19A

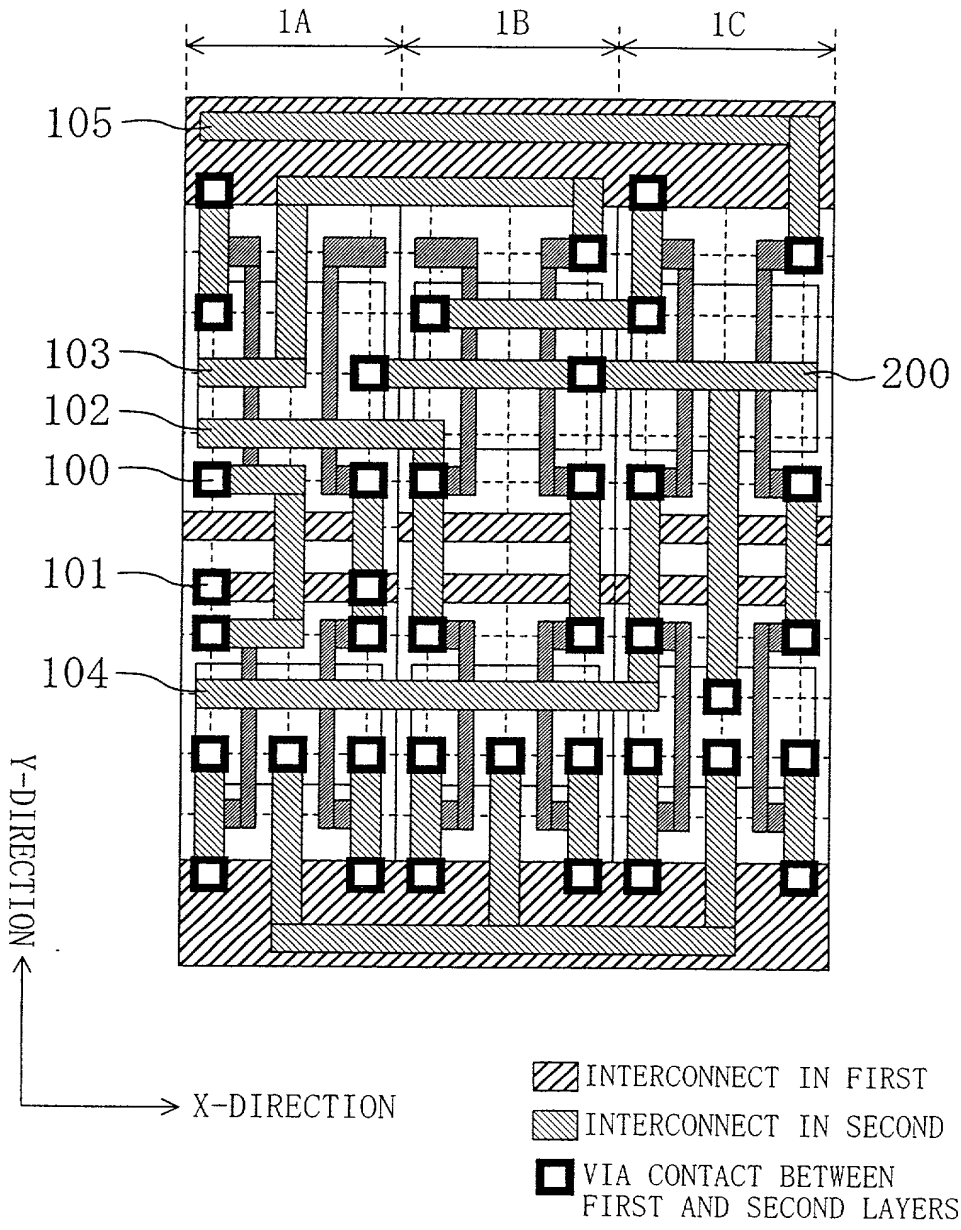

1A
1B
1C
105
103
102
100
101
104
200
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS

FIG. 19B

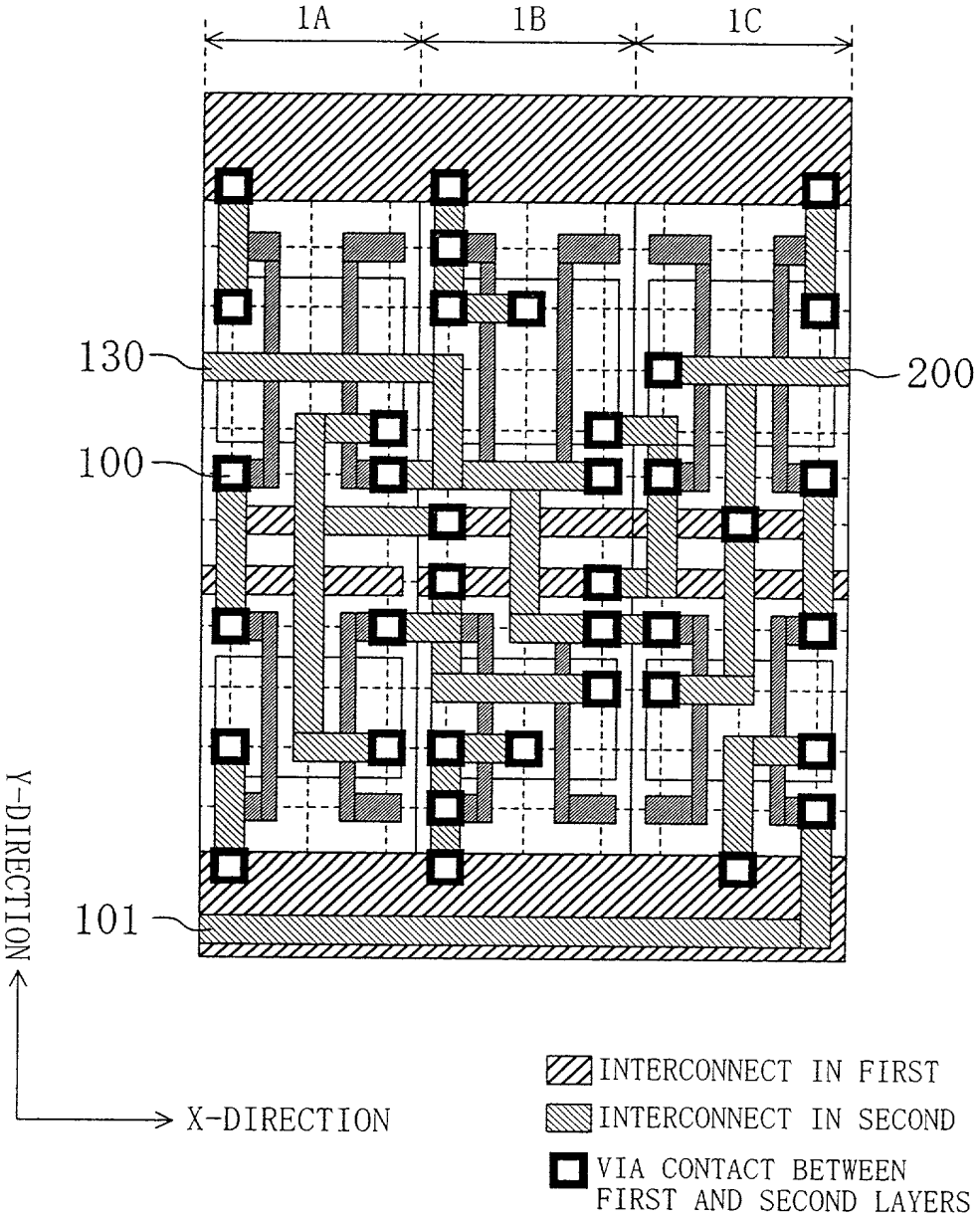

1A
1B
1C
130
200
100
101
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS

FIG. 20A

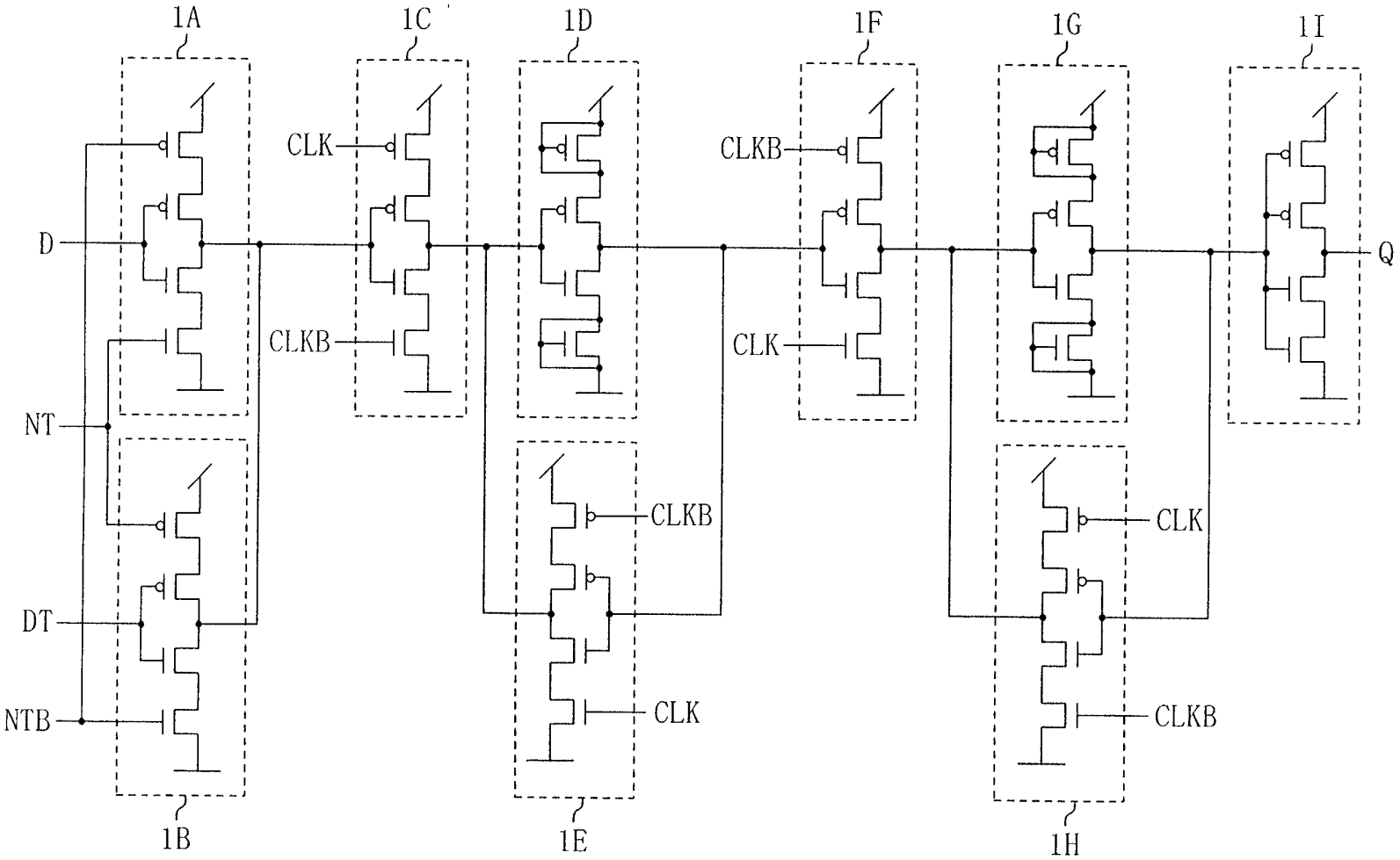

1A
1C
1D
1F
1G
1I
D
CLK
CLKB
CLKB
CLK
Q
NT
DT
NTB
CLKB
CLK
CLK
CLKB
1B
1E
1H

FIG. 20B

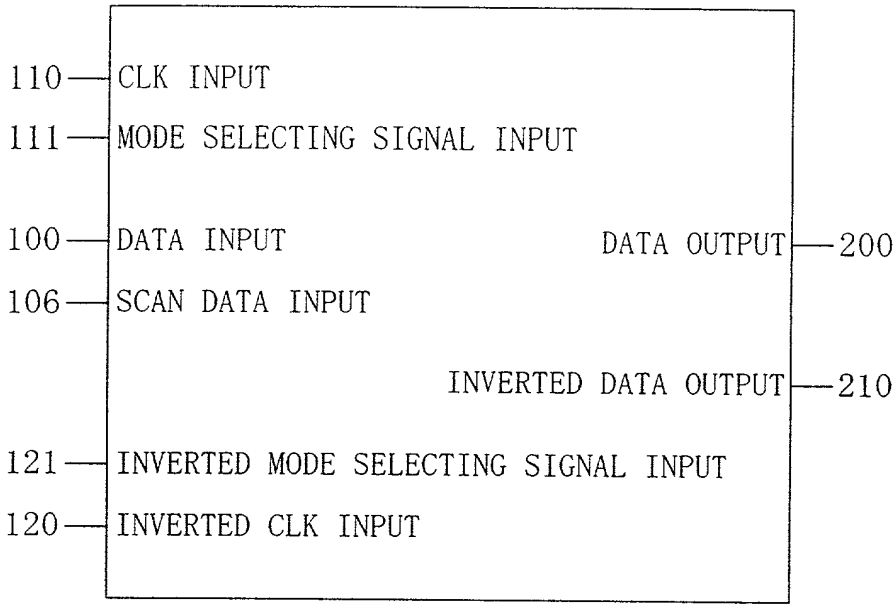


FIG. 20C

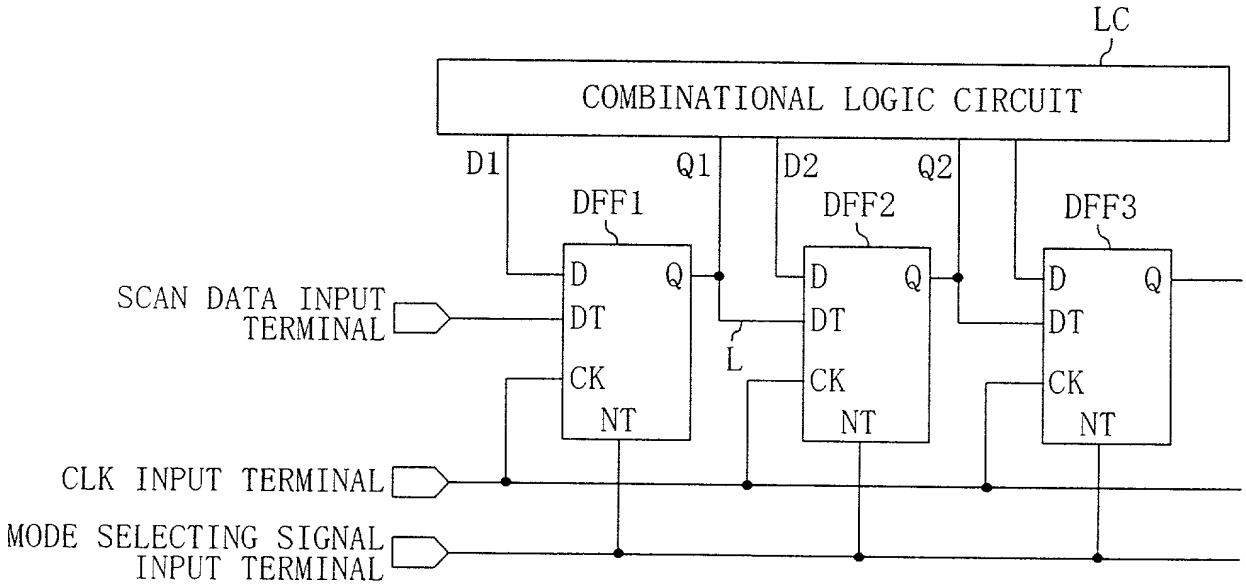


FIG. 20D

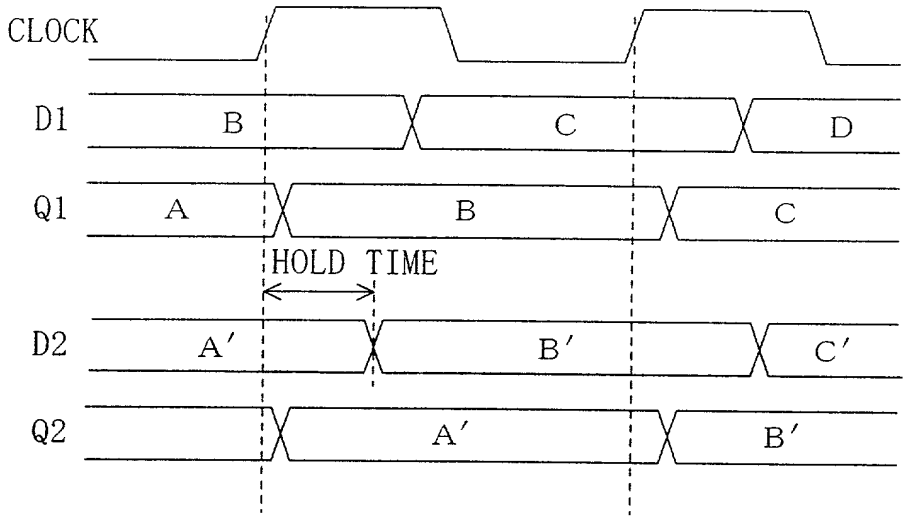


FIG. 20E

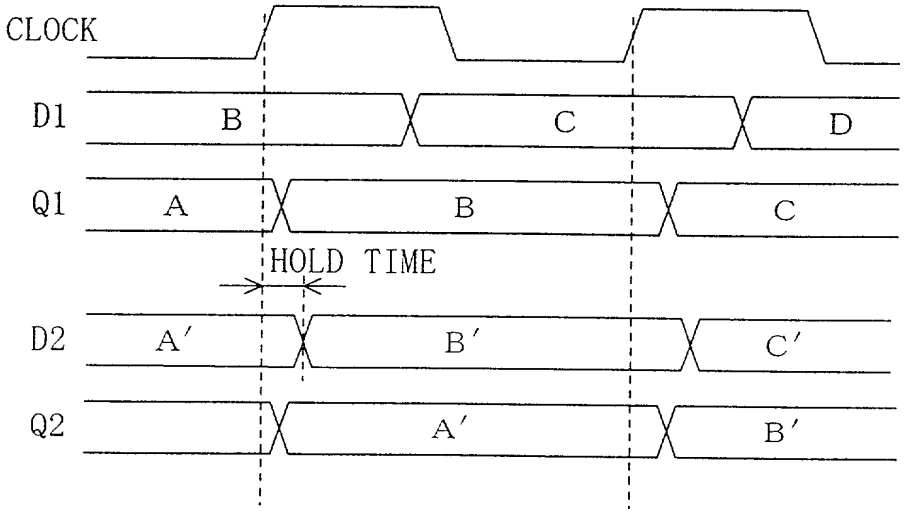


FIG. 20F

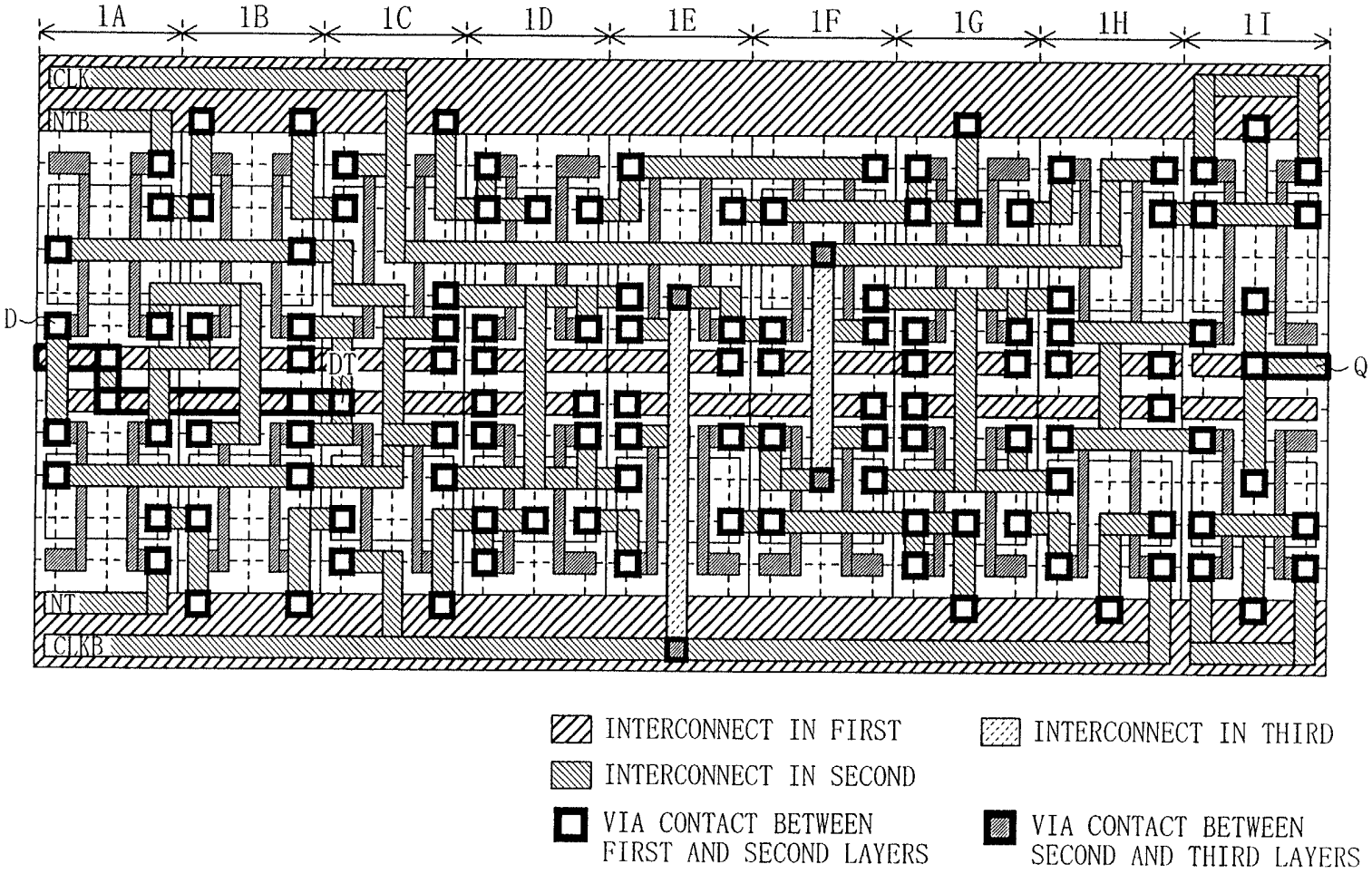

1A
1B
1C
1D
1E
1F
1G
1H
1I
CLK
NTB
D
DT
Q
NT
CLKB
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
INTERCONNECT IN THIRD
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
VIA CONTACT BETWEEN SECOND AND THIRD LAYERS

FIG. 20G

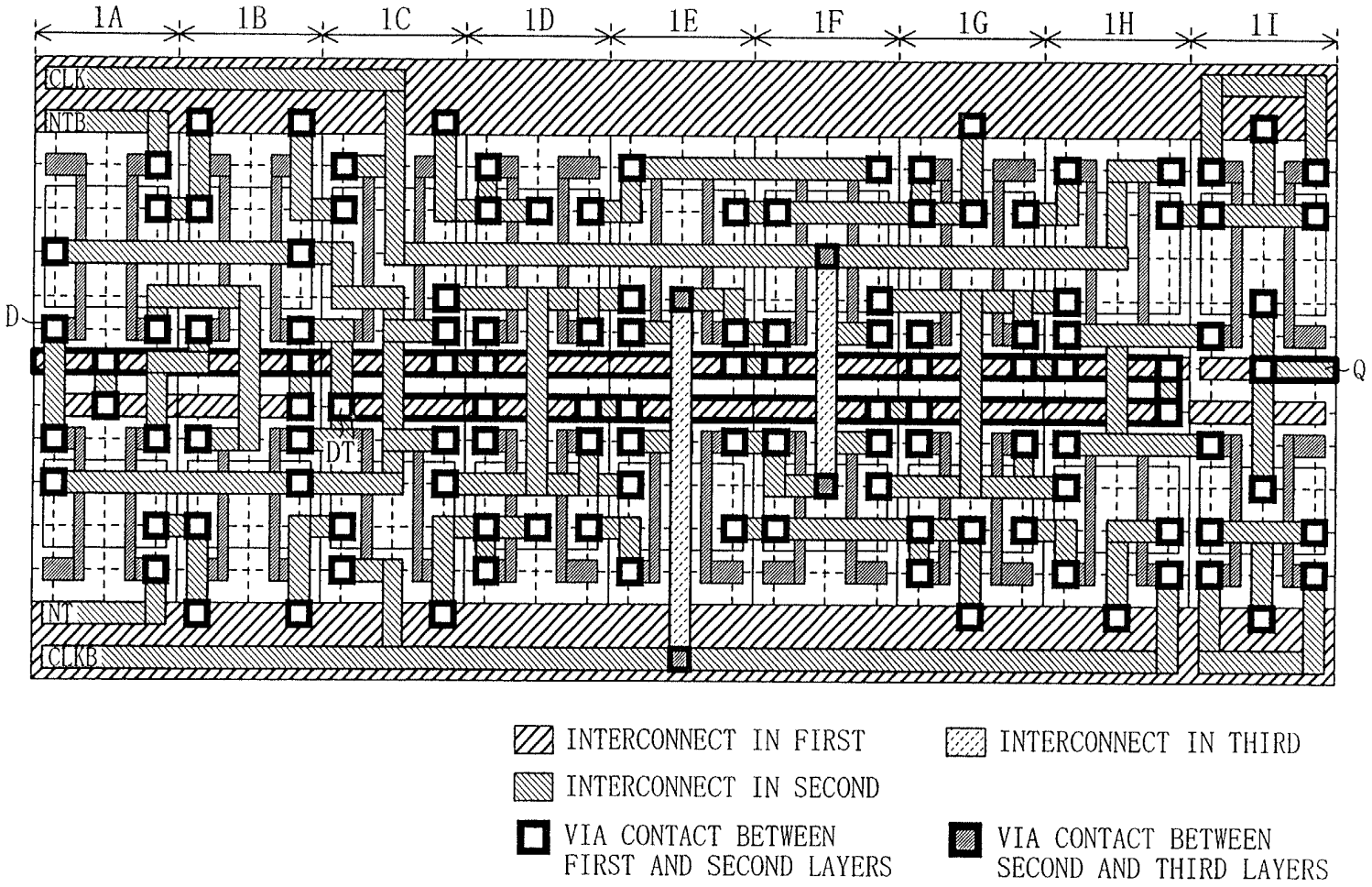

1A
1B
1C
1D
1E
1F
1G
1H
1I
CLK
NTB
D
Q
DT
NT
CLKB
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
INTERCONNECT IN THIRD
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
VIA CONTACT BETWEEN SECOND AND THIRD LAYERS

FIG. 20H

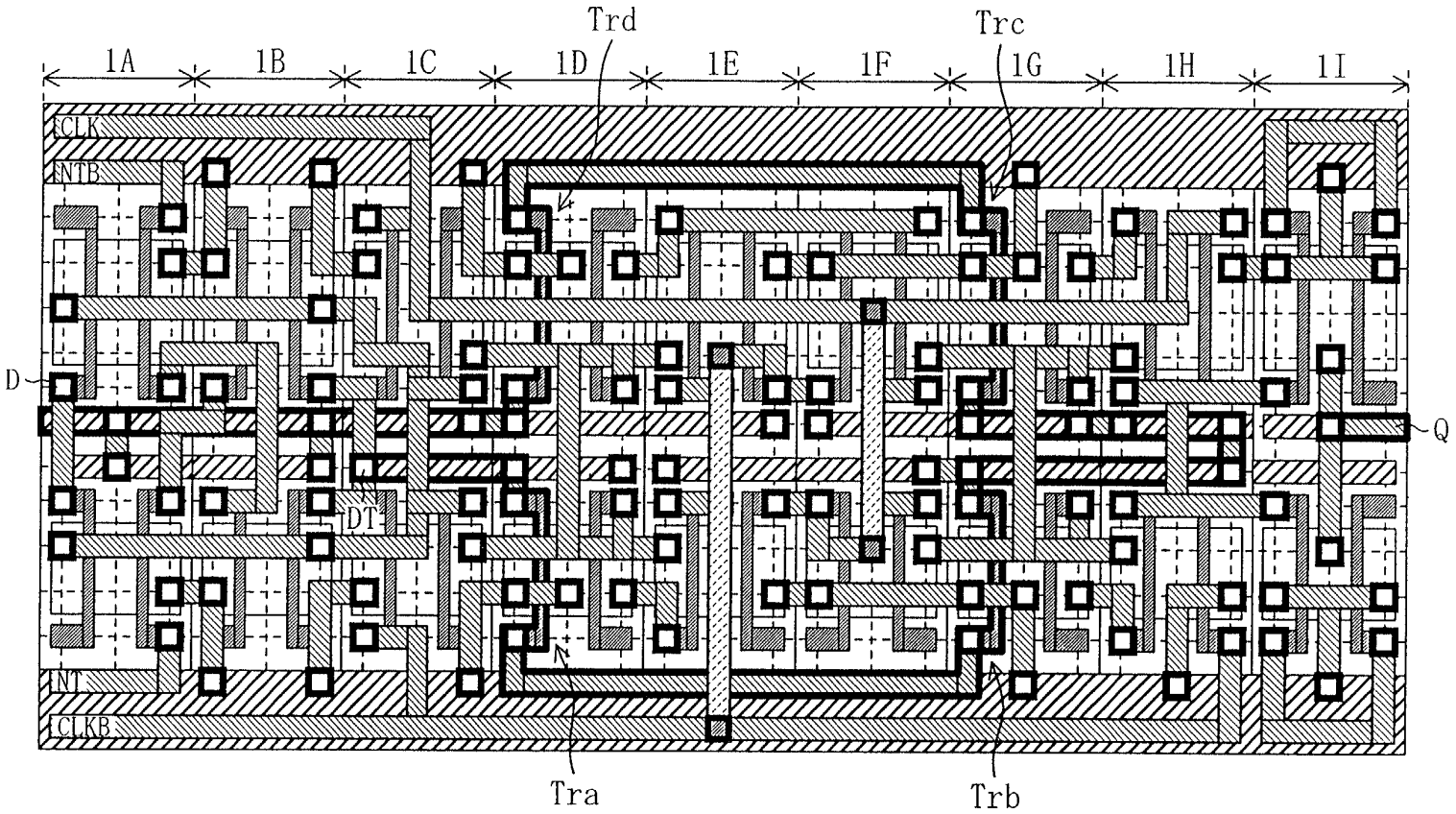

Trd
Trc
1A
1B
1C
1D
1E
1F
1G
1H
1I
CLK
INTB
D
Q
DT
INT
CLKB
Tra
Trb
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
INTERCONNECT IN THIRD
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
VIA CONTACT BETWEEN SECOND AND THIRD LAYERS

FIG. 21

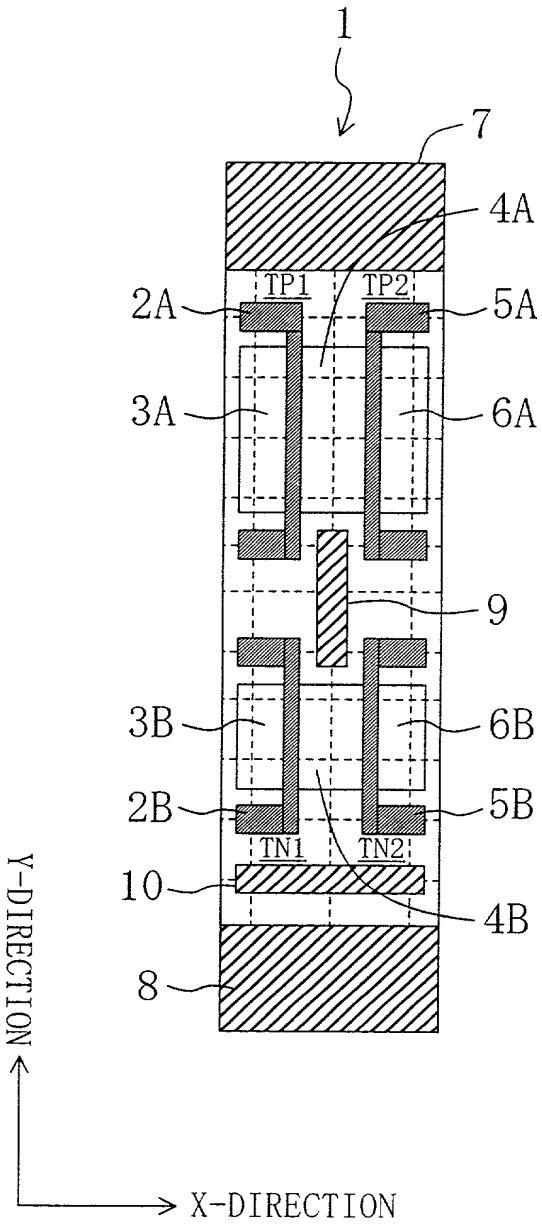

1
7
4A
TP1
TP2
2A
5A
3A
6A
9
3B
6B
2B
5B
TN1
TN2
10
4B
8
Y-DIRECTION
X-DIRECTION

FIG. 22

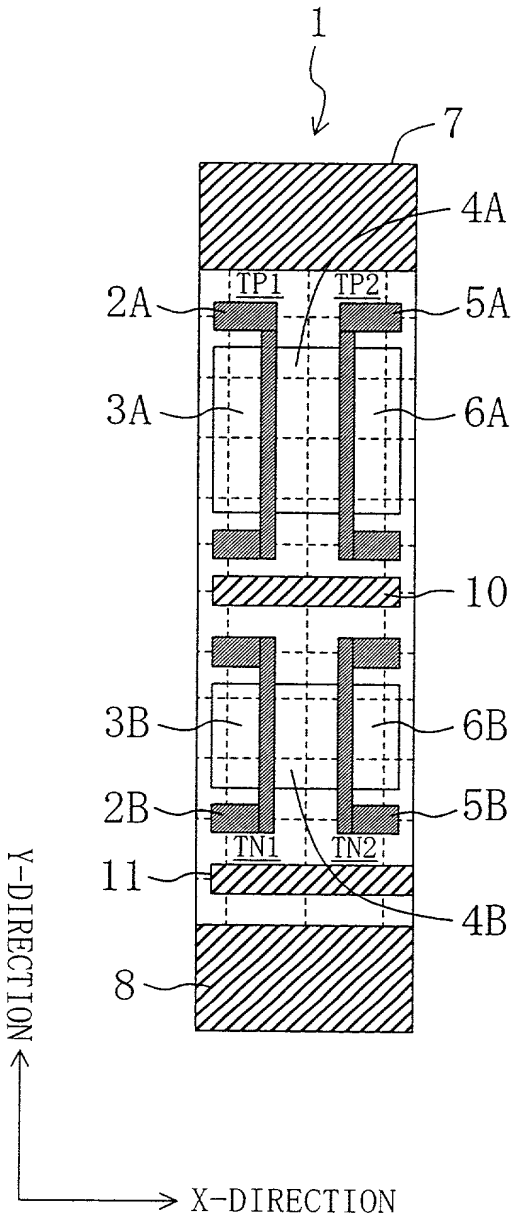

1
7
4A
TP1
TP2
2A
5A
3A
6A
10
3B
6B
2B
5B
TN1
TN2
11
4B
8
Y-DIRECTION
X-DIRECTION

FIG. 23

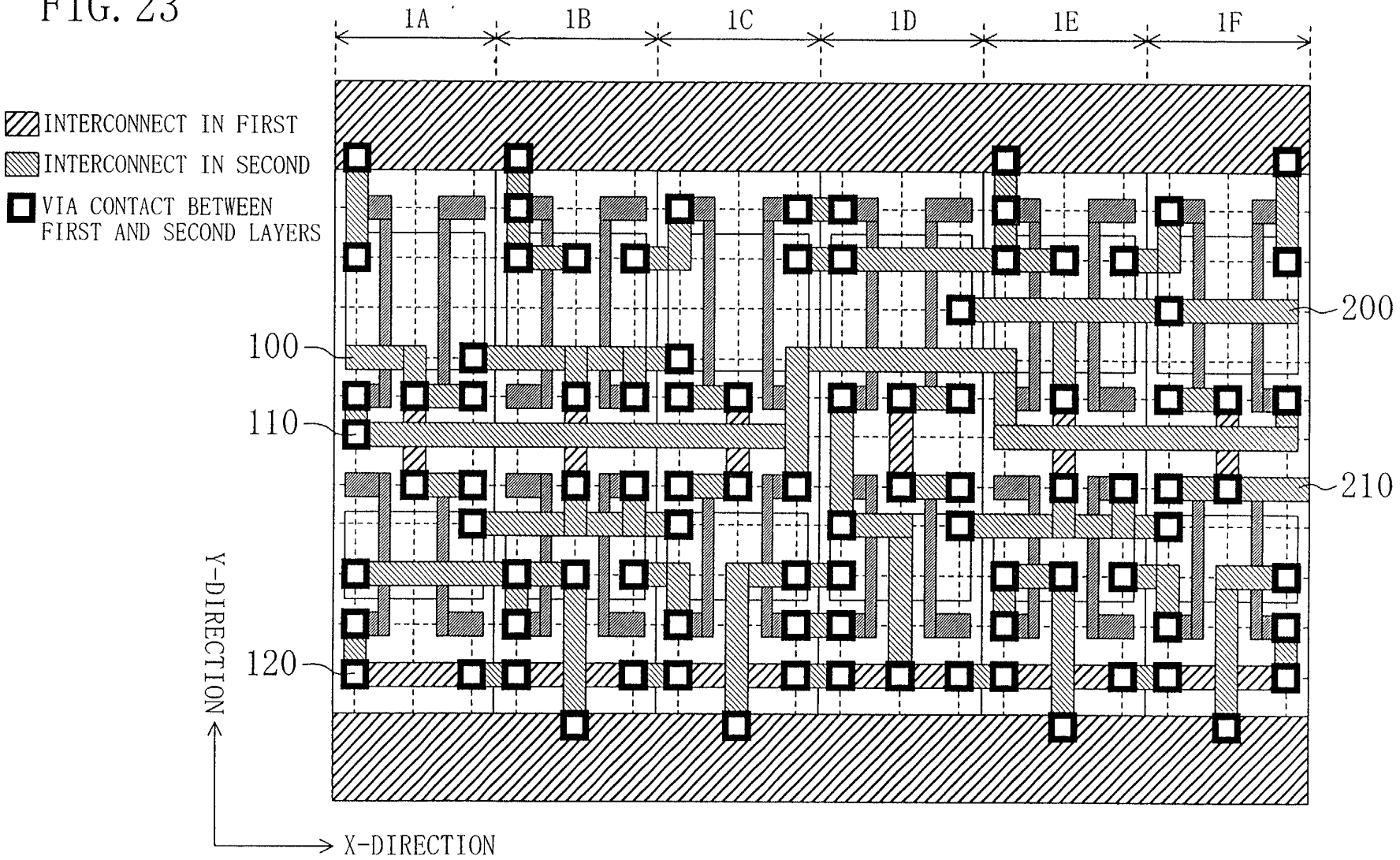

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
1A
1B
1C
1D
1E
1F
100
110
120
200
210
Y-DIRECTION
X-DIRECTION

FIG. 24

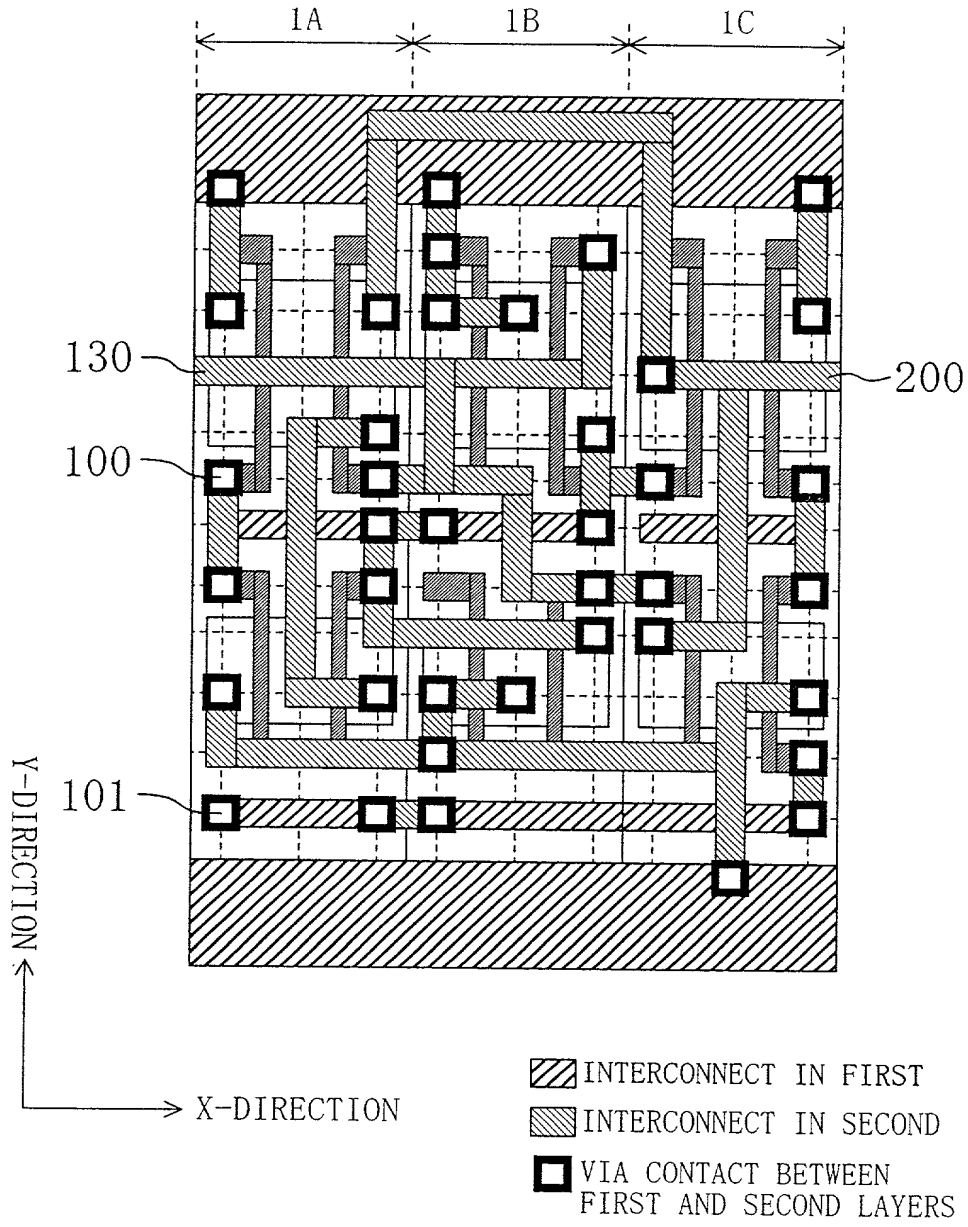

1A
1B
1C
130
200
100
101
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS

FIG. 25A

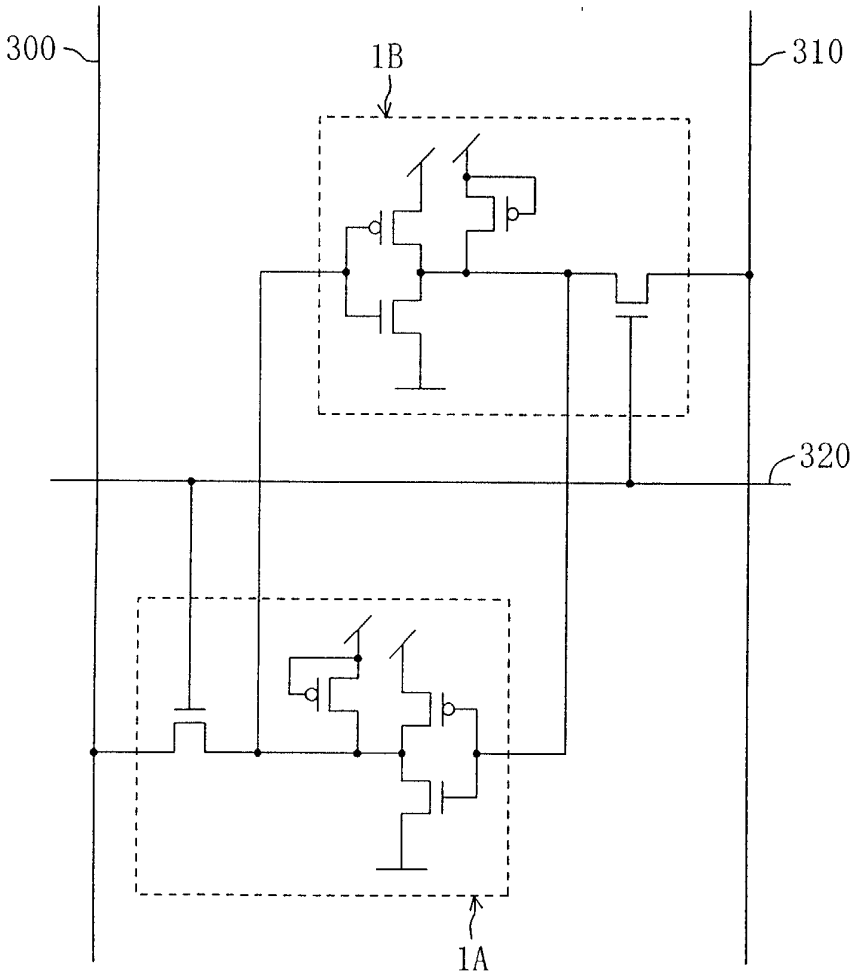


FIG. 25B

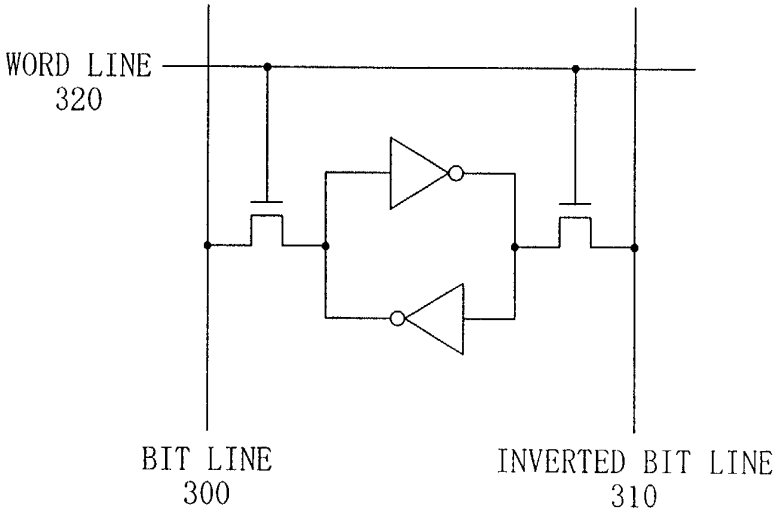


FIG. 26

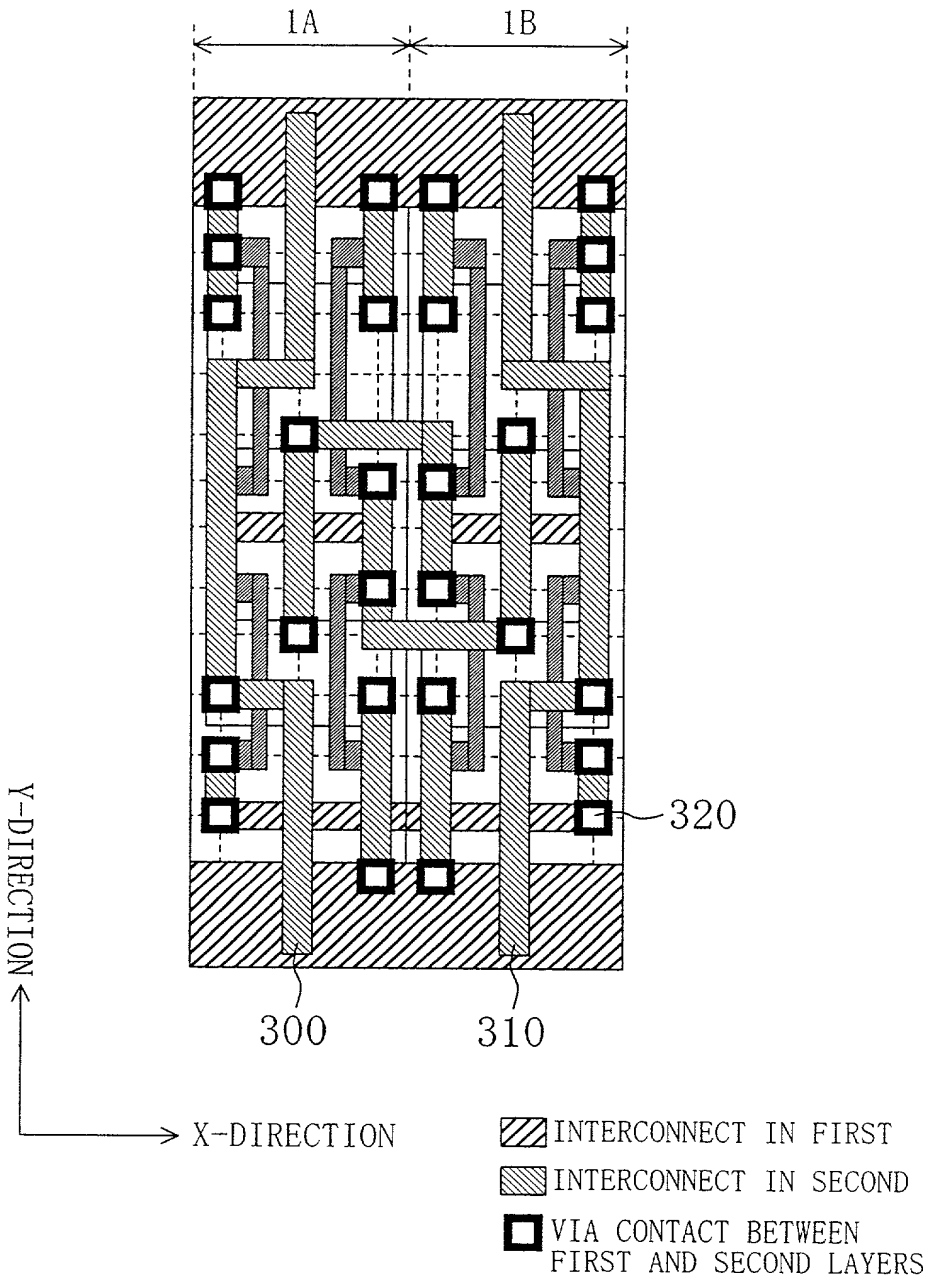

1A
1B
320
300
310
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS

FIG. 27A

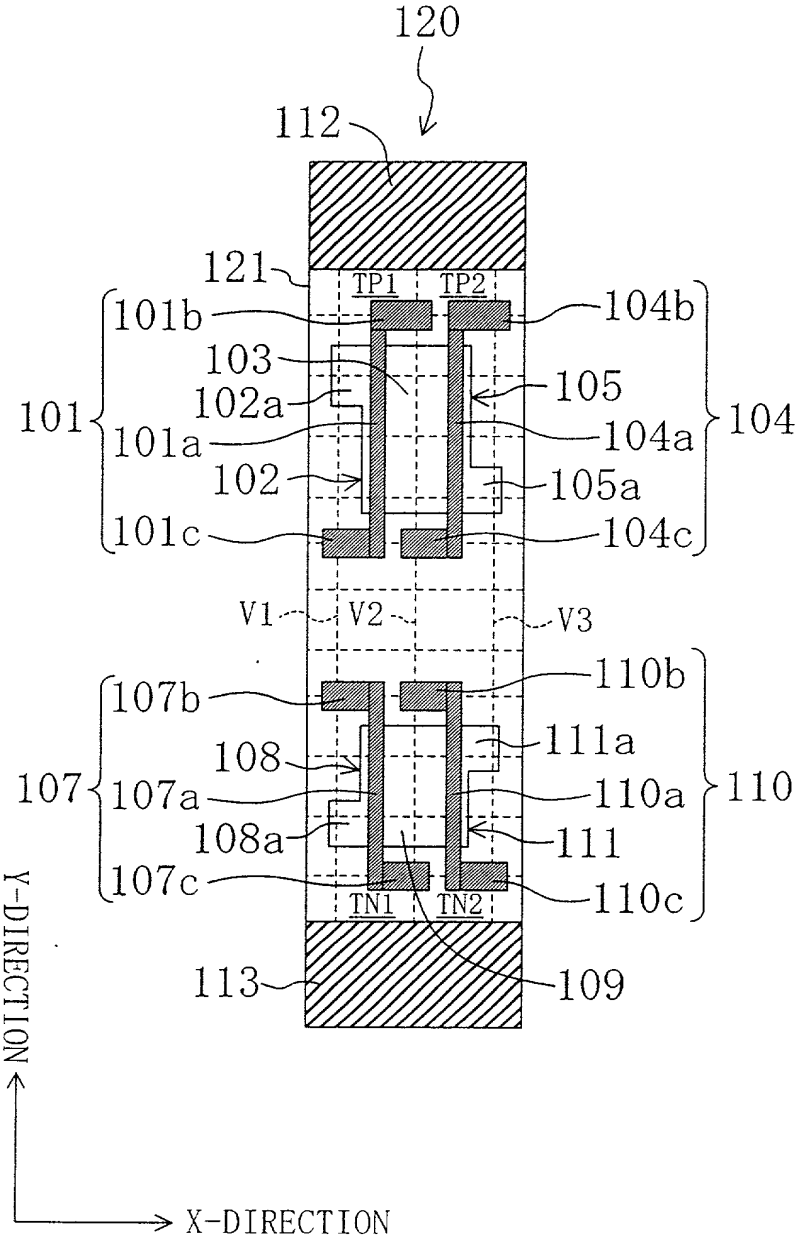


FIG. 27B

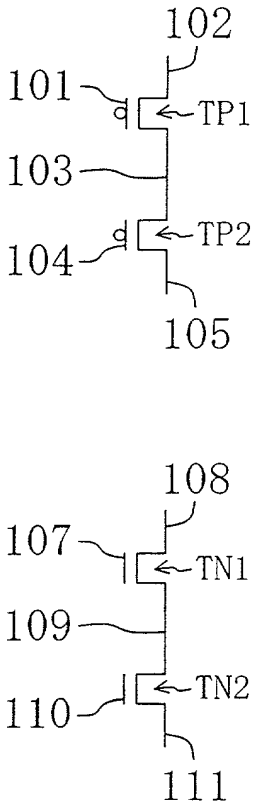


FIG. 28A

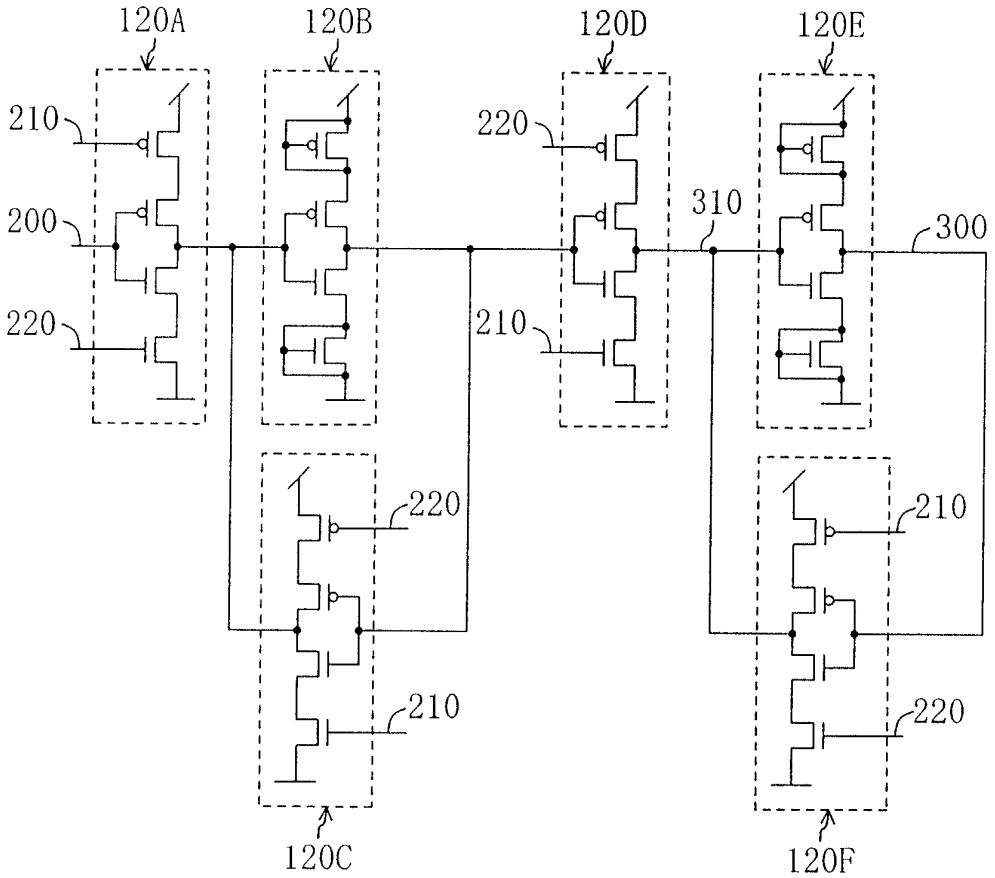


FIG. 28B

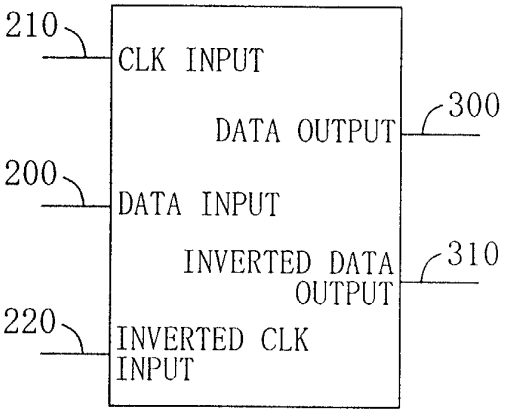


FIG. 28C

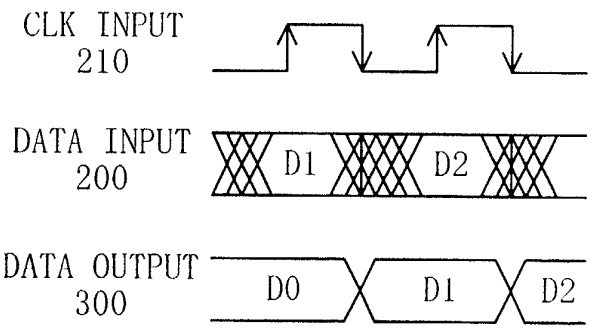


FIG. 29

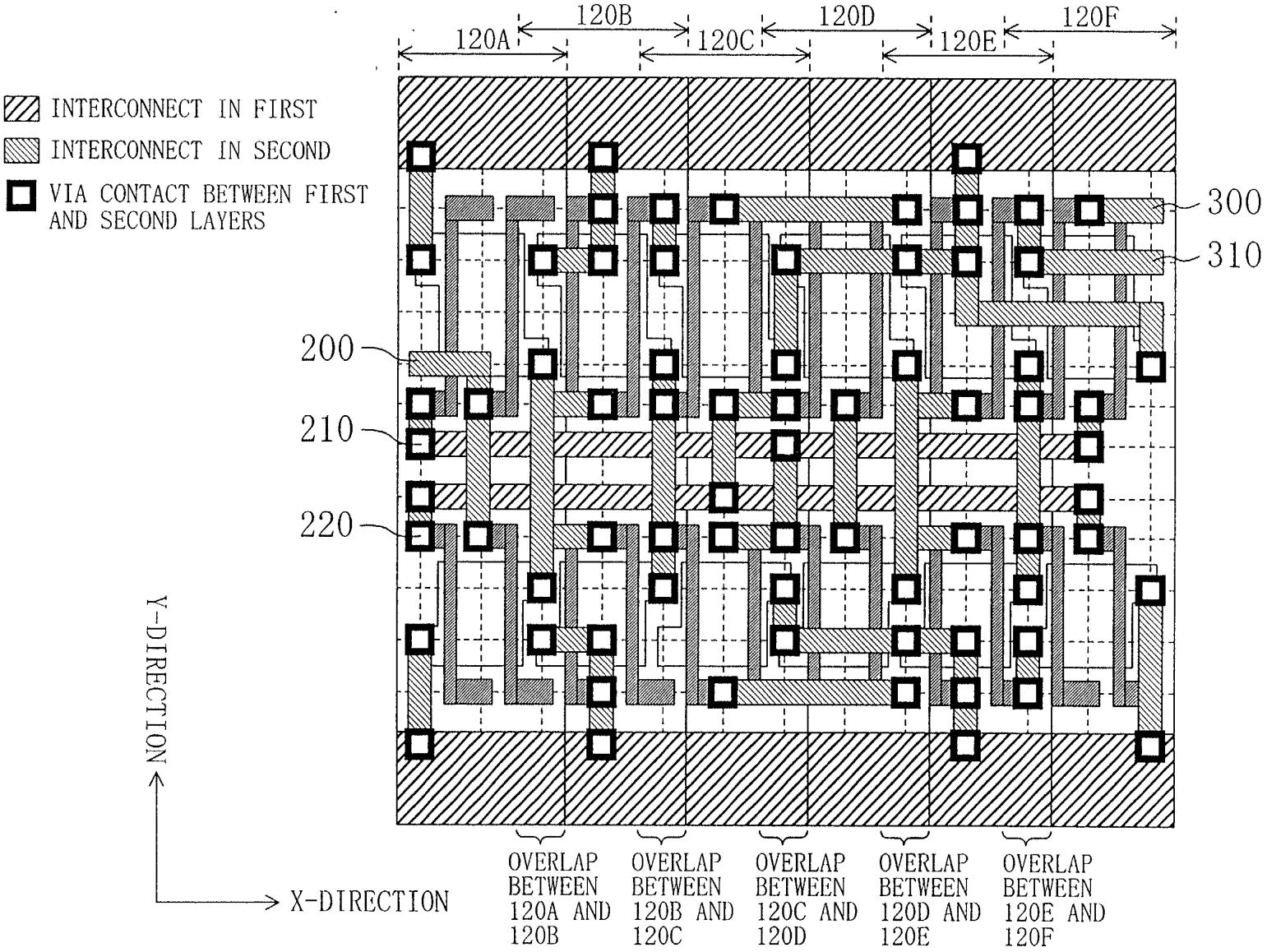

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
120A
120B
120C
120D
120E
120F
300
310
200
210
220
Y-DIRECTION
X-DIRECTION
OVERLAP BETWEEN 120A AND 120B
OVERLAP BETWEEN 120B AND 120C
OVERLAP BETWEEN 120C AND 120D
OVERLAP BETWEEN 120D AND 120E
OVERLAP BETWEEN 120E AND 120F

FIG. 30

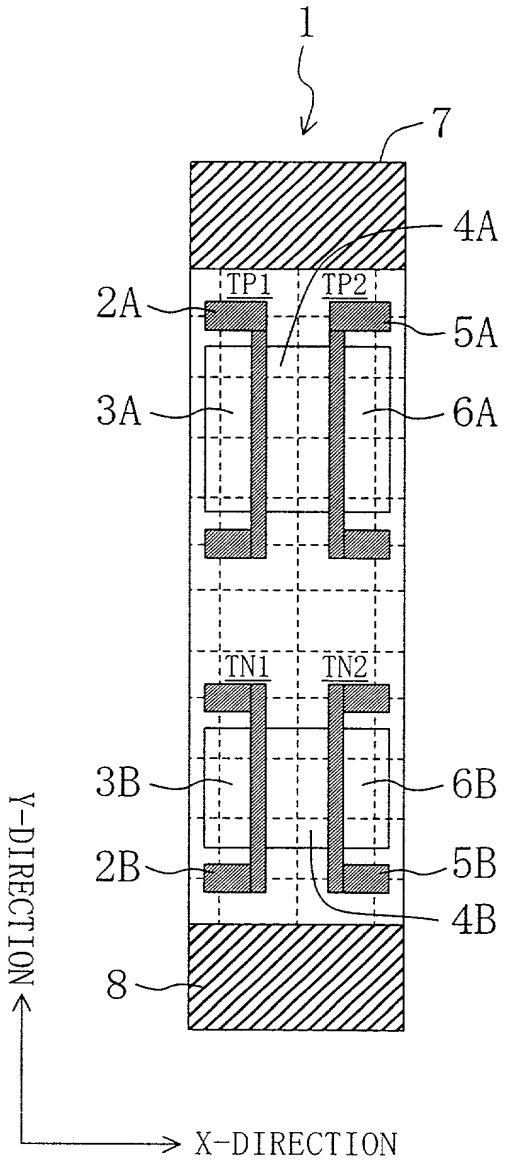

1
7
4A
TP1
TP2
2A
5A
3A
6A
TN1
TN2
3B
6B
2B
5B
4B
8
Y-DIRECTION
X-DIRECTION

FIG. 31A

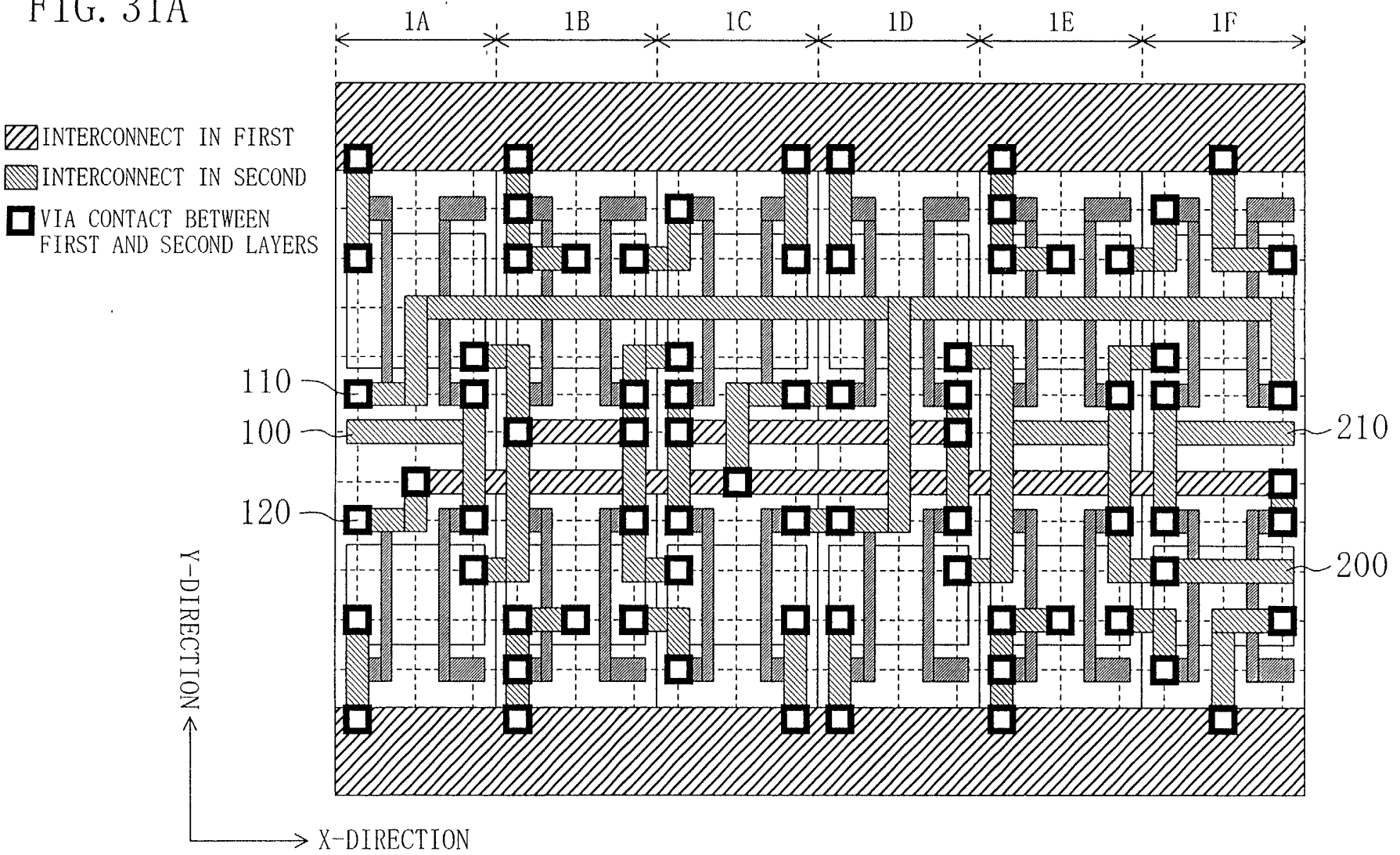

1A
1B
1C
1D
1E
1F
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
110
100
120
210
200
Y-DIRECTION
X-DIRECTION

FIG. 31B

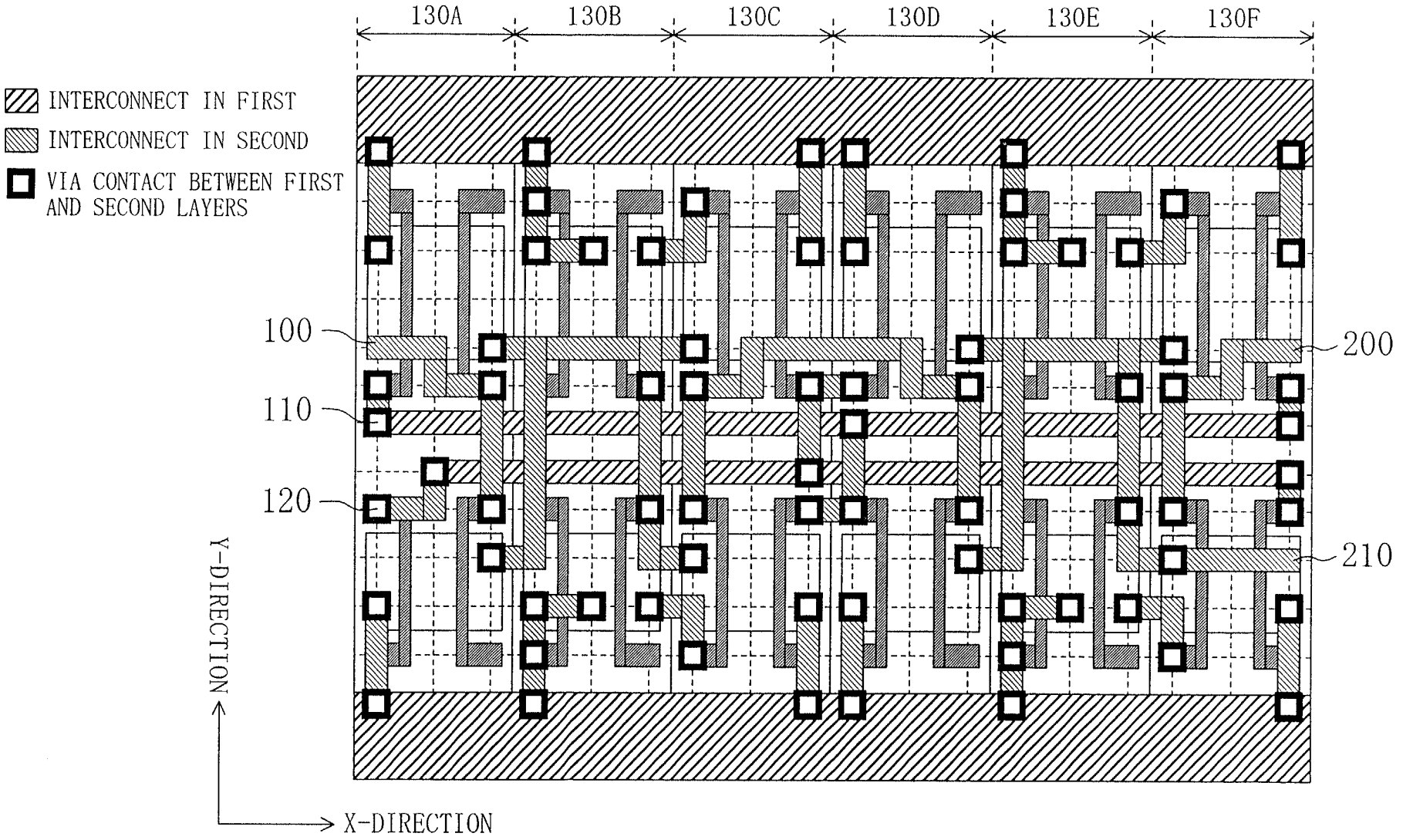

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
130A
130B
130C
130D
130E
130F
100
110
120
200
210
Y-DIRECTION
X-DIRECTION

FIG. 32

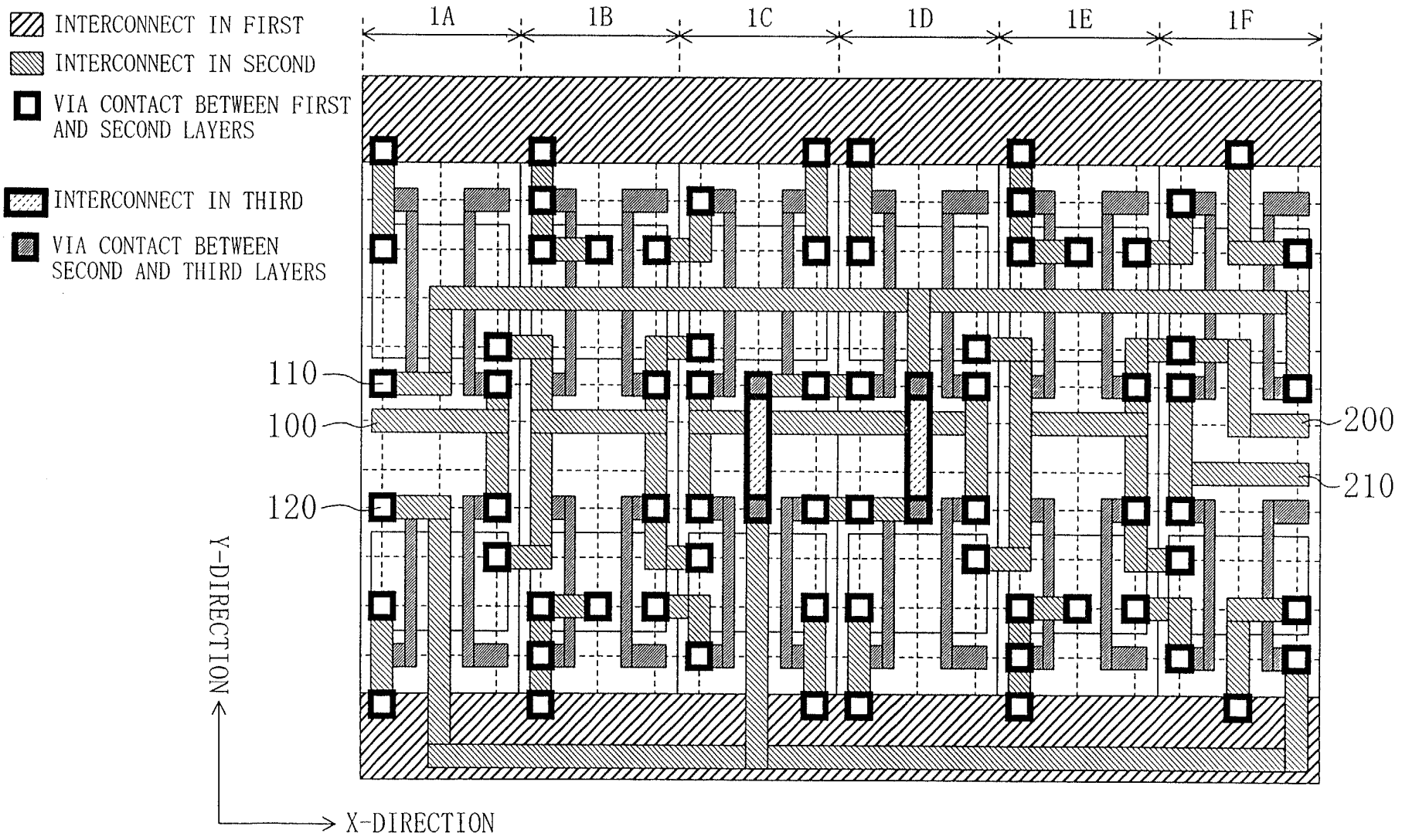

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
INTERCONNECT IN THIRD
VIA CONTACT BETWEEN SECOND AND THIRD LAYERS
1A
1B
1C
1D
1E
1F
110
100
120
200
210
Y-DIRECTION
X-DIRECTION

FIG. 33

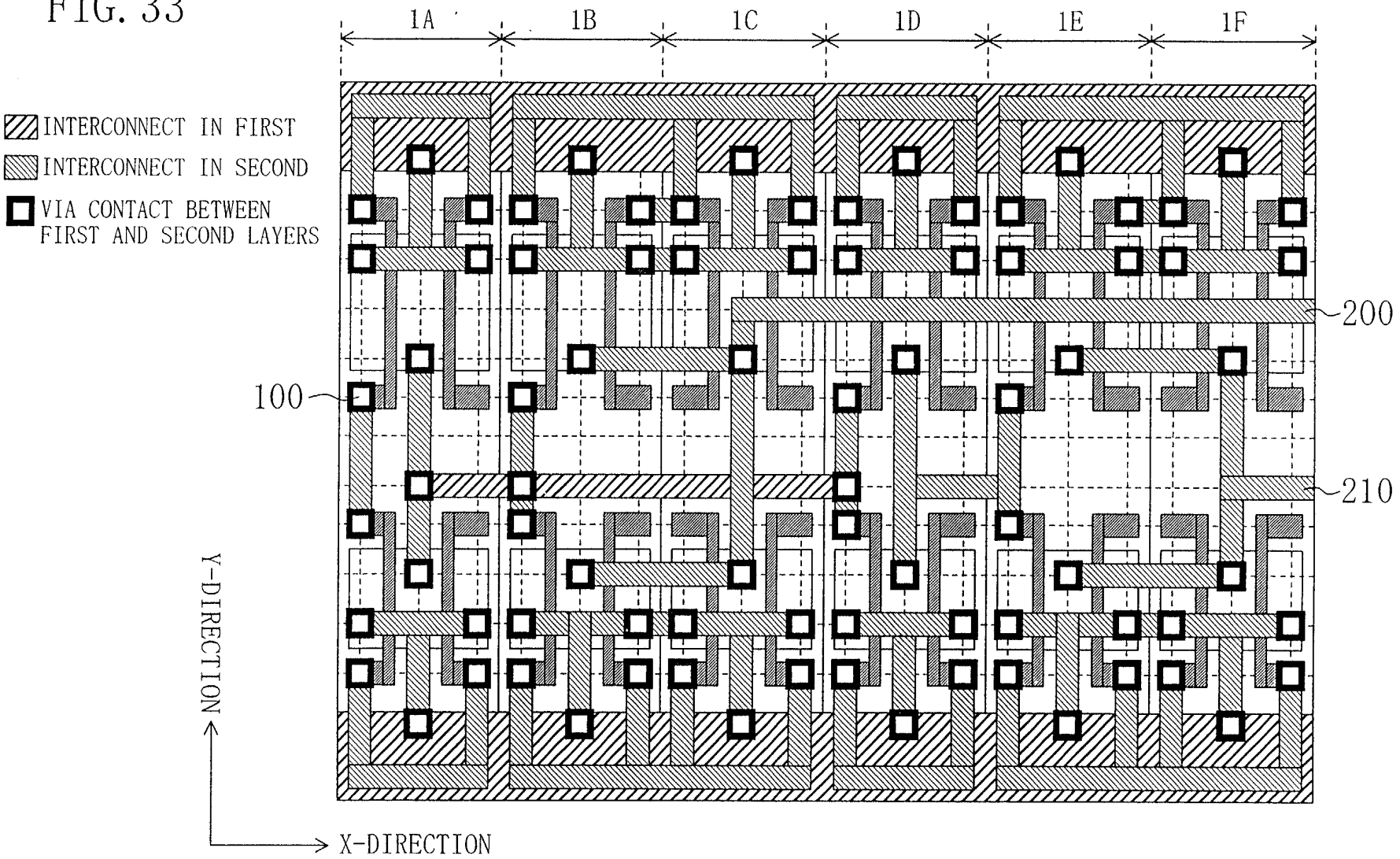

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
1A
1B
1C
1D
1E
1F
100
200
210
Y-DIRECTION
X-DIRECTION

FIG. 34

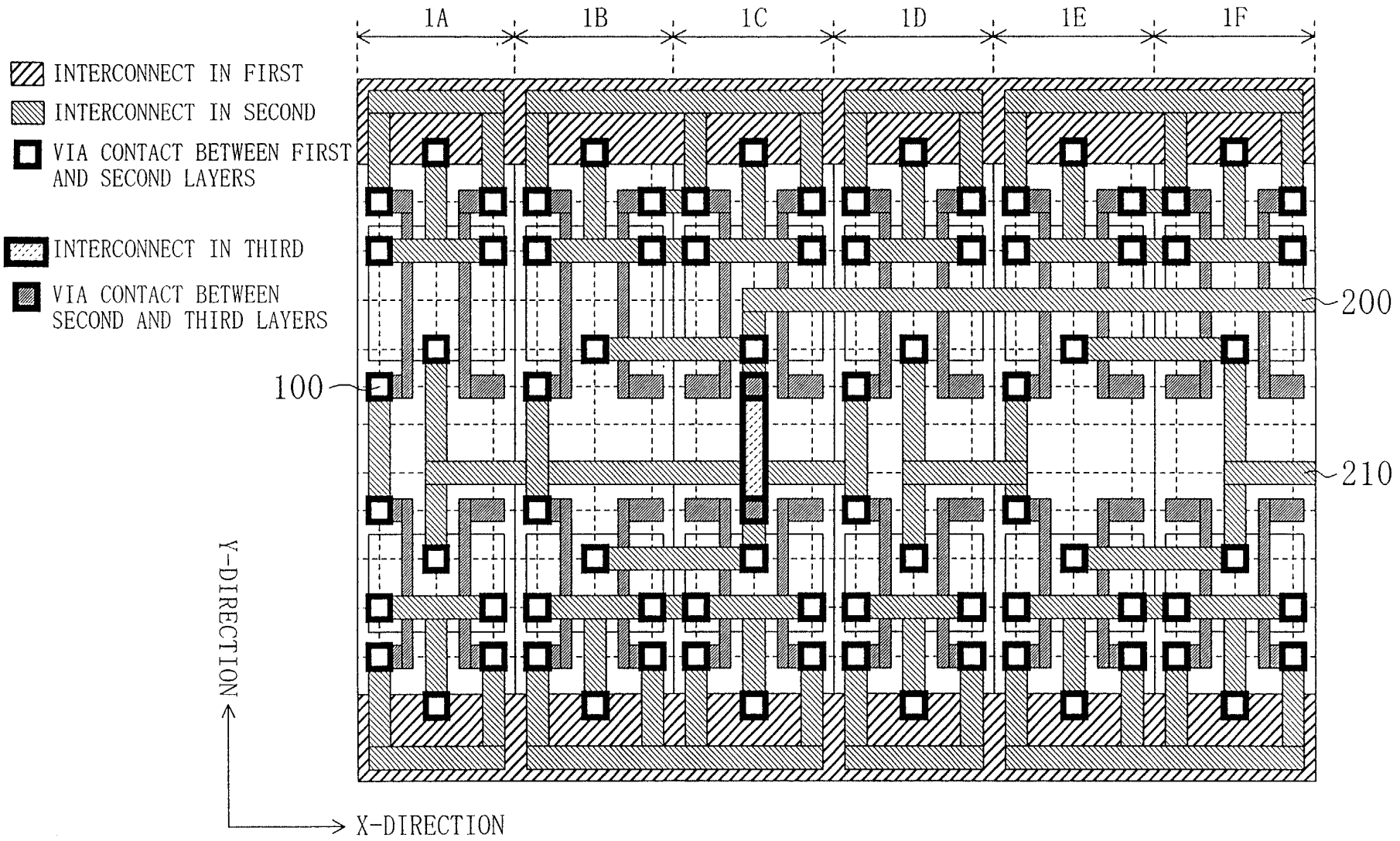

INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
INTERCONNECT IN THIRD
VIA CONTACT BETWEEN SECOND AND THIRD LAYERS
1A
1B
1C
1D
1E
1F
100
200
210
Y-DIRECTION
X-DIRECTION

FIG. 35

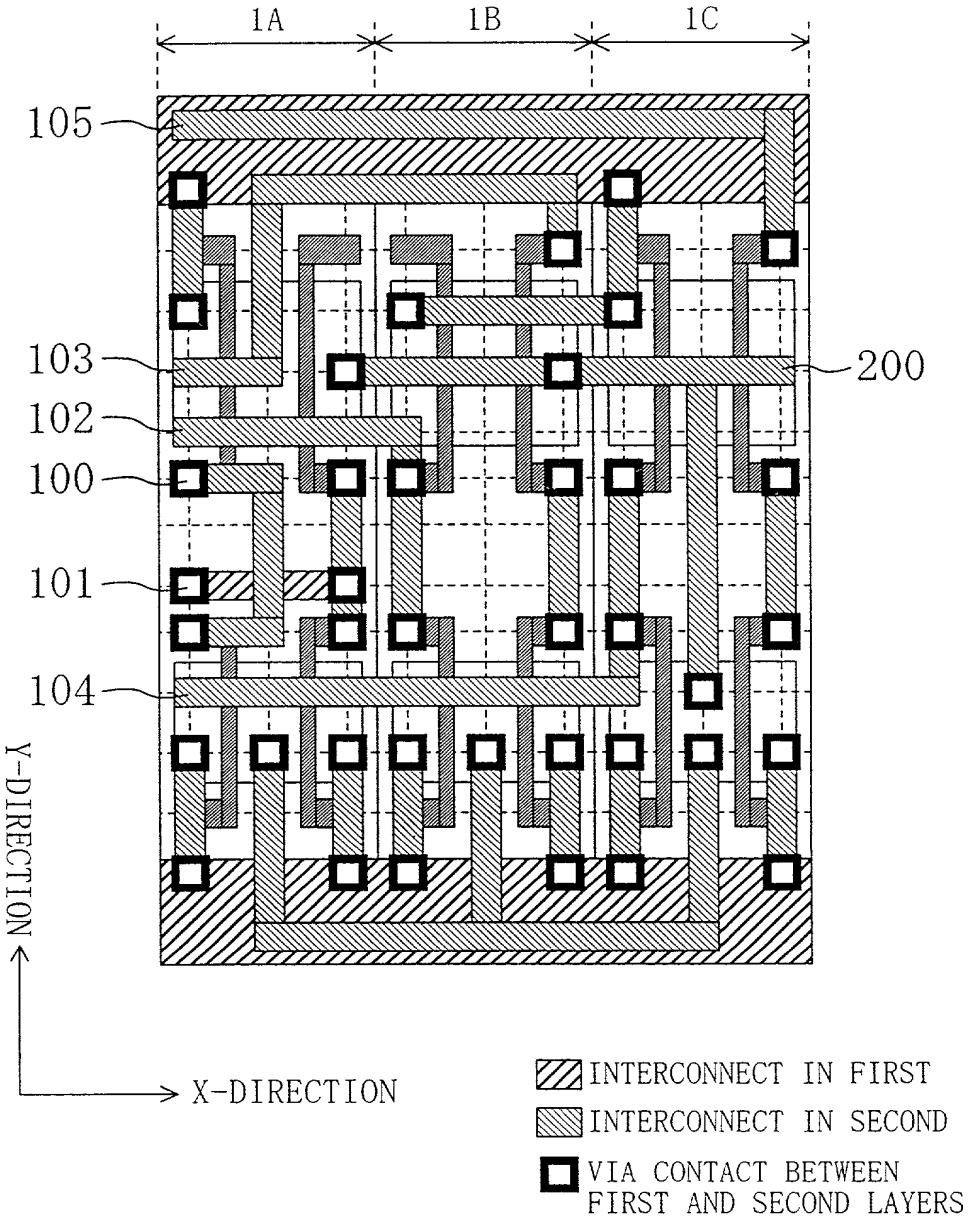

1A
1B
1C
105
103
102
100
101
104
200
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS

FIG. 36

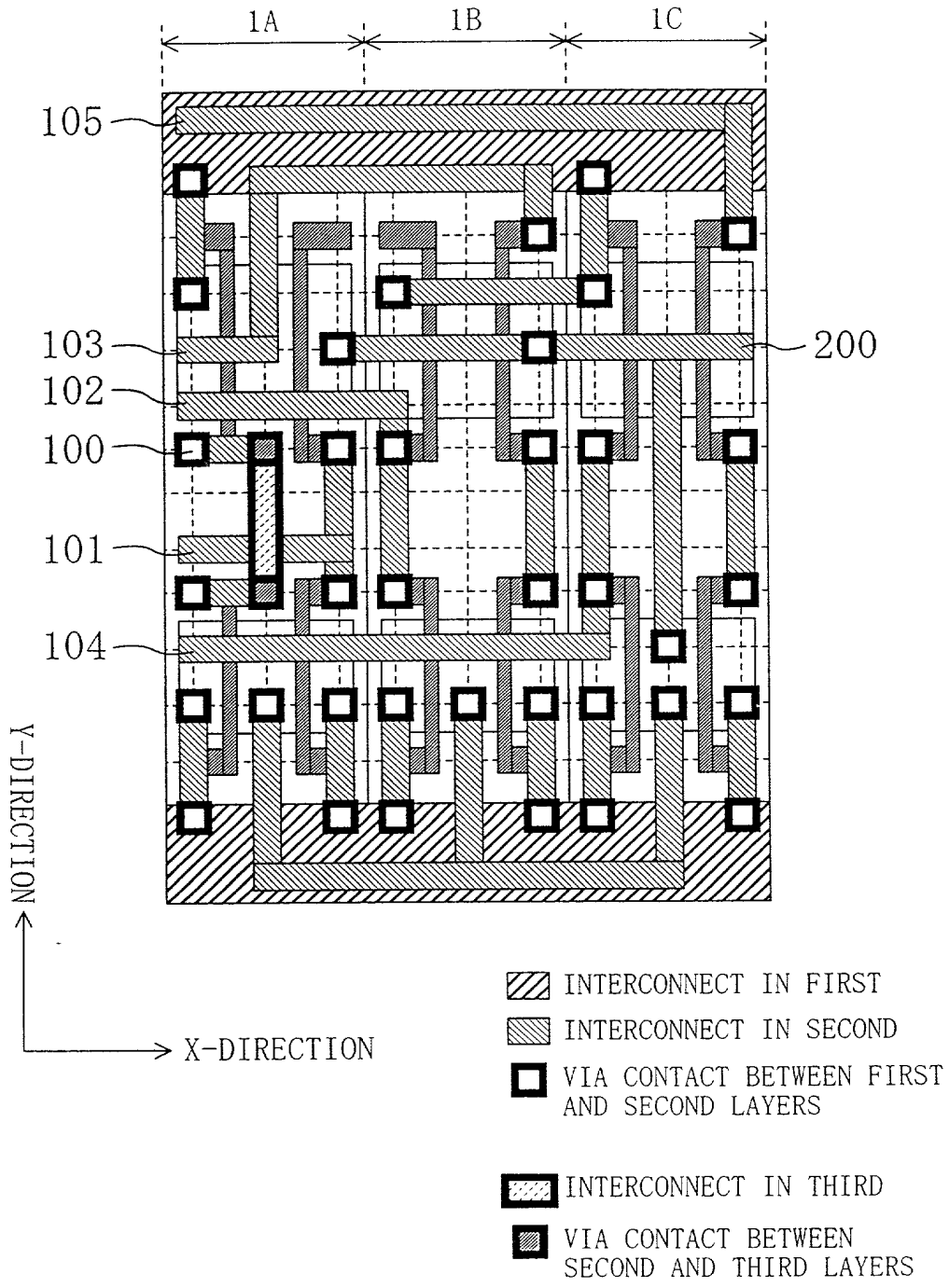

1A
1B
1C
105
103
102
100
101
104
200
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
INTERCONNECT IN THIRD
VIA CONTACT BETWEEN SECOND AND THIRD LAYERS

FIG. 37

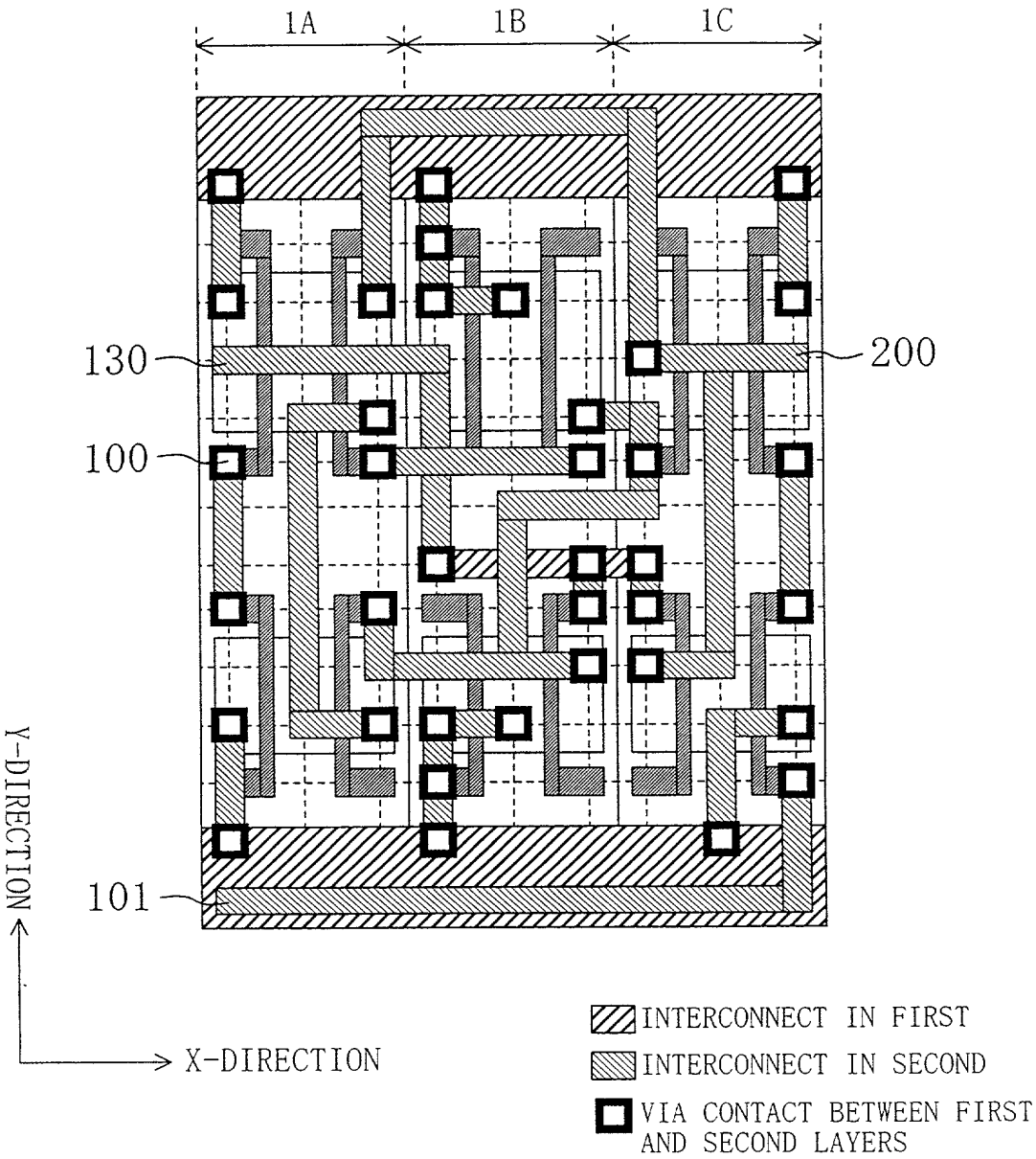

1A
1B
1C
130
200
100
101
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS

FIG. 38

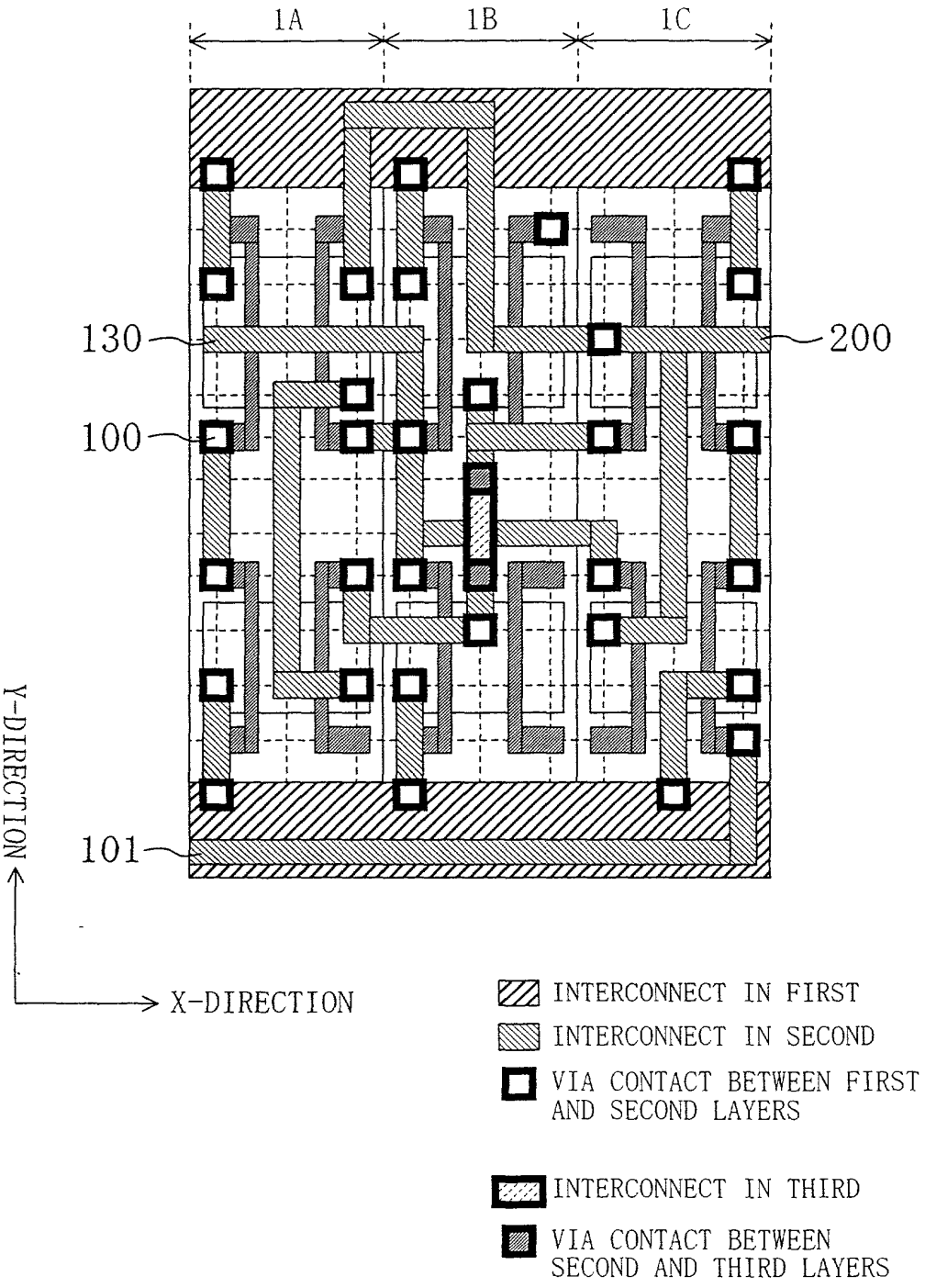

1A
1B
1C
130
200
100
101
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
INTERCONNECT IN THIRD
VIA CONTACT BETWEEN SECOND AND THIRD LAYERS

FIG. 39

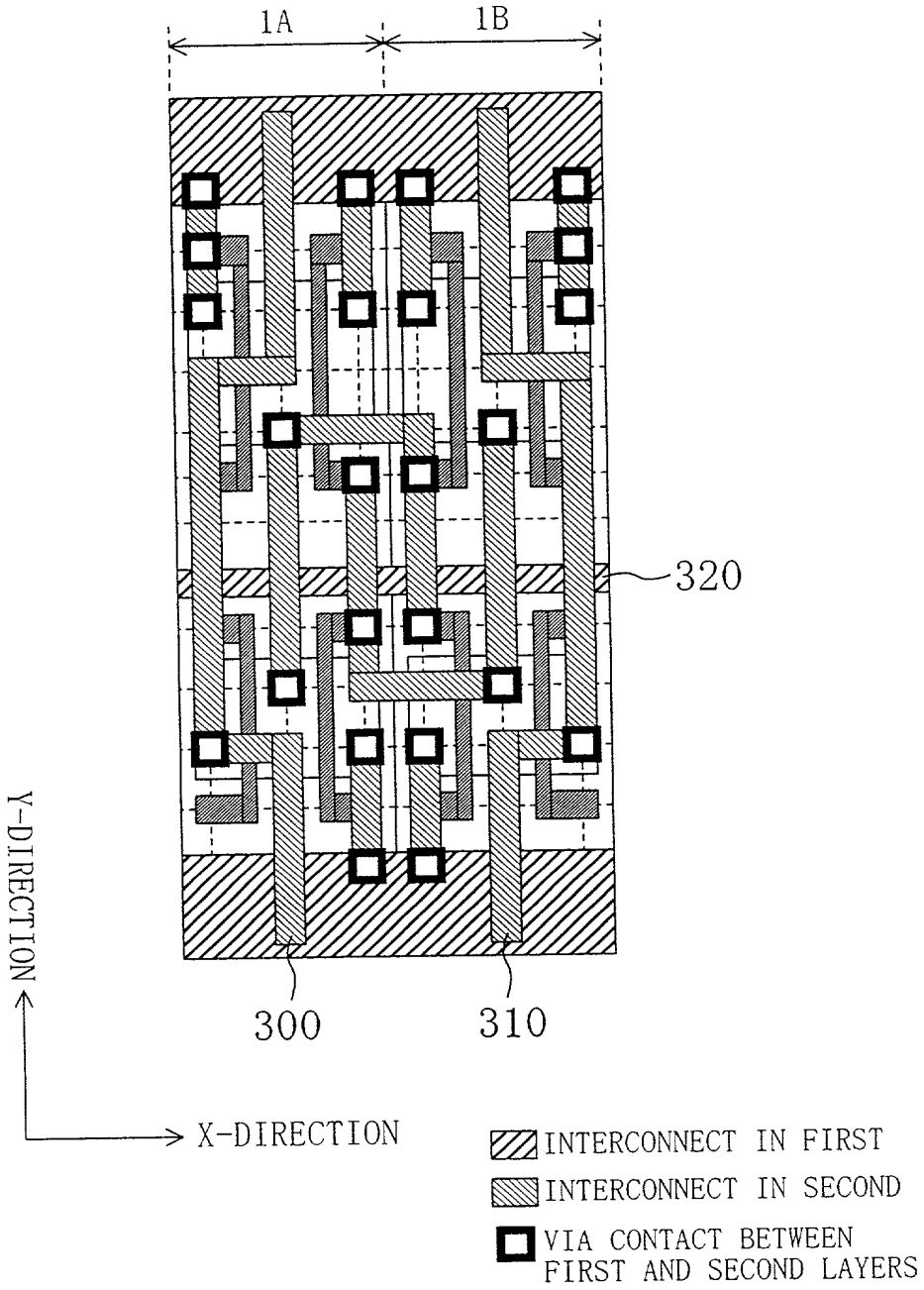

1A
1B
320
300
310
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS

FIG. 40

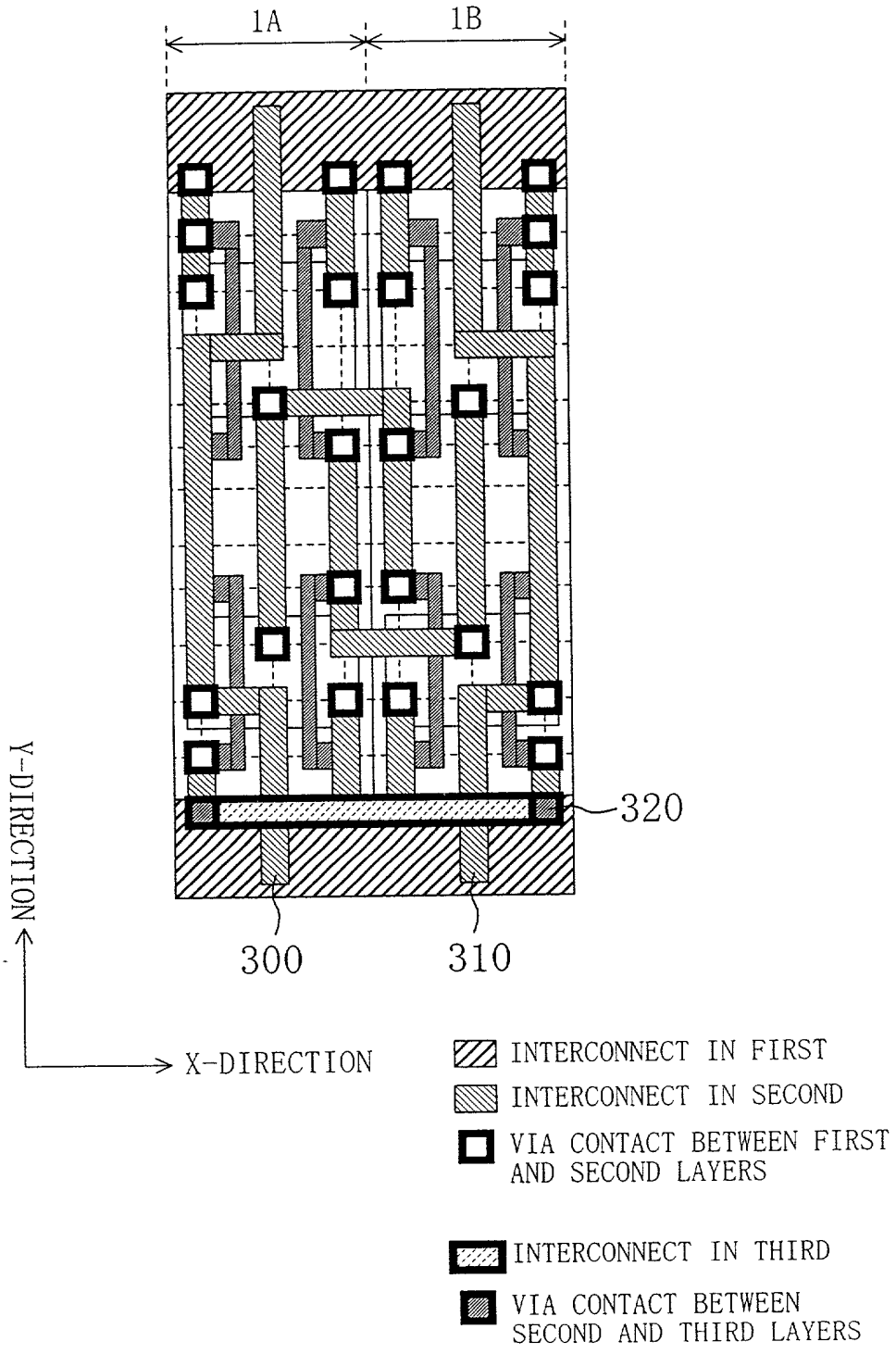
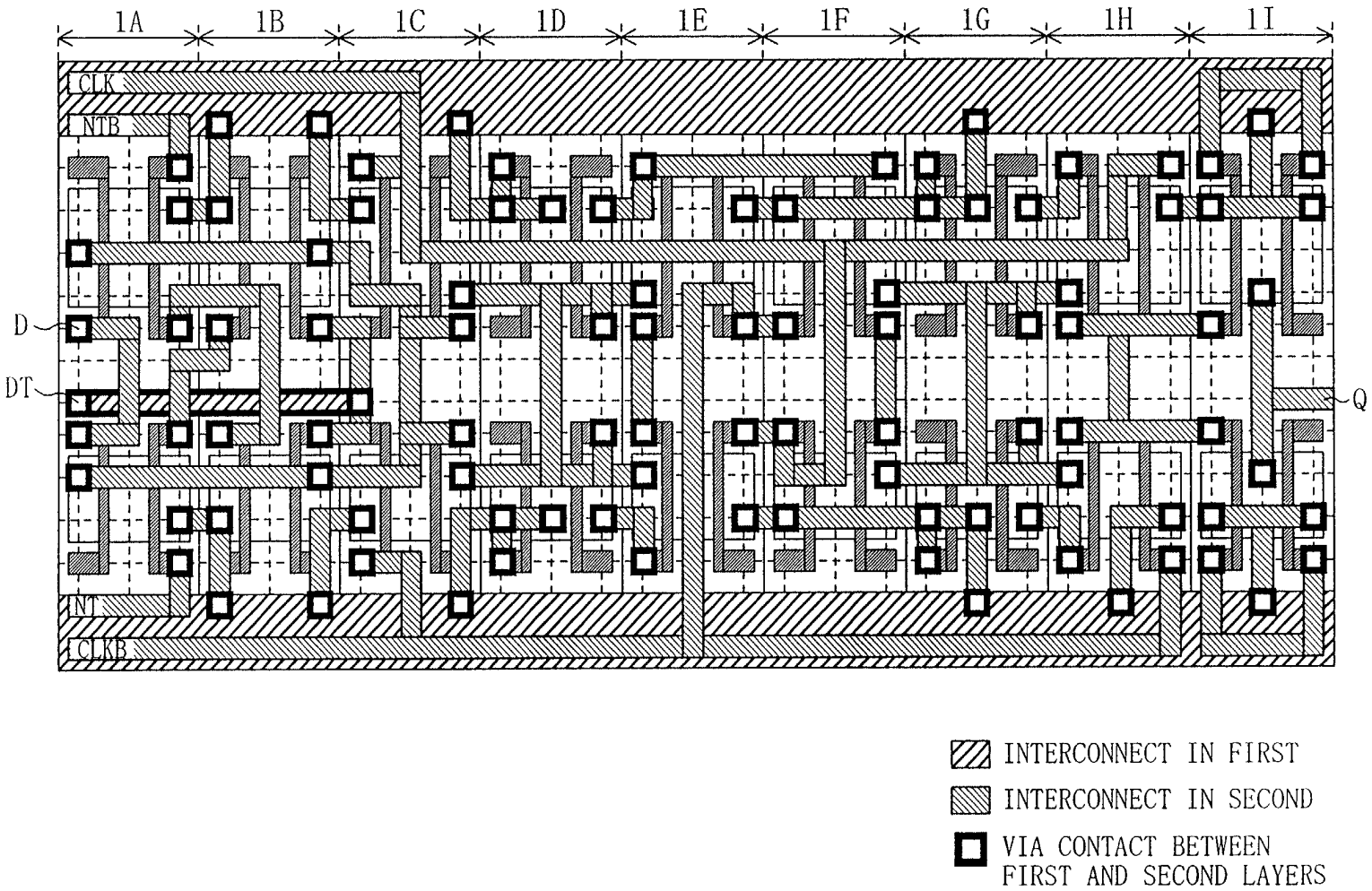

1A
1B
320
300
310
Y-DIRECTION
X-DIRECTION
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS
INTERCONNECT IN THIRD
VIA CONTACT BETWEEN SECOND AND THIRD LAYERS

FIG. 41


1A
1B
1C
1D
1E
1F
1G
1H
1I
CLK
NTB
D
DT
Q
NT
CLKB
INTERCONNECT IN FIRST
INTERCONNECT IN SECOND
VIA CONTACT BETWEEN FIRST AND SECOND LAYERS